

Document Title: Valuing Methane Emission Changes in Regulatory Benefit-Cost Analysis

Approximate Length: 10 pages

Supporting Materials: Marten et al. (2014) (36 pages excluding Appendices)

Abstract and Charge Questions:

Consistent with Executive Order 12866, EPA conducts benefit-cost analysis to inform policy makers and the public about the potential economic implications of regulatory actions. EPA has promulgated regulations that result in changes in CH₄ emissions but has not yet quantified such impacts in its main benefit-cost analyses. Direct estimates of the benefits of mitigating CH₄ emissions have been presented in the scientific literature, but EPA has not used these estimates in benefit-cost analyses because they are inconsistent with U.S. Government (USG) estimates of the social cost of carbon dioxide (SC-CO₂).¹ A recently published paper (Marten et al. 2014) presents estimates of the social cost of CH₄ (SC-CH₄) that are consistent with USG estimates of the SC-CO₂. While it is anticipated that the USG will continue to improve the models and data it uses to estimate the SC-CO₂ in accordance with evolving scientific and economic understanding, the enclosed paper illustrates how EPA could apply the SC-CH₄ estimates from Marten et al. to improve upon the current treatment of methane impacts in regulatory impact analysis (RIA) so that they need not be implicitly assigned a value of zero in policy assessment. Consistent with EPA's peer review guidance, the Agency is seeking review of the application of these new benefit estimates to regulatory analysis before using them in an RIA. Specifically we seek guidance on the following questions:

1. Has EPA correctly interpreted the SC-CH₄ estimates provided in Marten et al. (2014) as designed to measure the monetized value of the climate impacts from marginal changes in CH₄ emissions in a way that is appropriate for use in benefit-cost analysis of regulatory actions projected to change CH₄ emissions?

I have read both Marten et al. (2014) and the review document and feel that the review document provides an accurate summary of the issues and methodologies discussed in Marten et al. (2014). I feel that Table 3 of the review document provides a nice example of how the SC-CH₄ estimates from Marten et al. (2014) could be used in BCAs of proposed regulations and underscores the bias that arises if a GWP-based approach is used rather than the direct approach proposed by Marten et al. (2014).

There, of course, is a whole host of issues that arise when applying any social cost measure to regulatory analyses, which have been extensively discussed in the literature

¹ See the February 2010 Technical Support Document (TSD) and November 2013 TSD Update for a complete discussion of the methods used to develop the USG SC-CO₂ estimates:
<http://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf>,
<http://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf>.

and which I expand on in my responses below. A key issue that I would like to raise here is that these measures are only appropriate for marginal changes in CH₄. These measures are not designed to be used to evaluate non-marginal changes in methane emissions (or any other gas, for that matter). Therefore, caution must be used when applying social cost measures like this.

2. Do you agree that the Marten et al. SC-CH₄ estimates are consistent with the USG SC-CO₂ estimates?

“Consistent” can have many interpretations. I will say that the Marten et al. SC-CH₄ estimates are computed in a similar way as the SC-CO₂ estimates, so in this regard, the two estimates are “consistent.” However, CO₂ is more explicitly modeled in the three models than CH₄ so in this regard they are not “consistent.” However, this inconsistency is due to limitations of the models and I feel that Marten et al. have taken appropriate steps to address these limitations the best way possible. However, gaps still remain and should be recognized.

3. Do you agree with EPA’s characterization of the limitations of using the global warming potential (GWP) to approximate the SC-CH₄ (and other non-CO₂ GHGs)?

The review document (and Marten et al) discusses a number of problems that arise when GWP is used to approximate SC-CH₄: (1) in the introduction and in section 2, the authors point out that the indirect effects of CH₄, as a precursor to tropospheric ozone and stratospheric water vapor, can amplify radiative forcing significantly (which would not be captured in the GWP); (2) GWP ignores important nonlinear relationships beyond radiative forcing in the chain between emissions and damages—e.g., increased agricultural productivity due to CO₂ fertilization would be incorrectly attributed to CH₄ if the GWP was used; (3) GWP does not account for differences in time horizons between gases—e.g., since CH₄ has a shorter lifetime than CO₂, the GWP approach would underestimate the SC-CH₄.

Although all three are technically correct, I feel that (1) and (2) could be addressed to a certain extent (although not perfectly) by adjusting the GWP to account for these biases. However, the temporal issue raised in (3) seems more difficult to address through simple adjustments to the GWP.

In sum, I agree with the authors that problems exist and that the direct approach in theory is the best way to avoid these issues.

4. Do you agree with EPA’s assessment that direct estimates of the SC-CH₄, as developed by Marten et al., are more appropriate for monetizing changes in CH₄ emissions than using the GWP to scale the USG SC-CO₂?

As discussed in my response to question 3 above, I agree that the direct approach is likely a superior approach to the indirect GWP approach. However, it should be noted that the direct approach has issues as well. Namely, as discussed in section 3, most models do not include an atmospheric stock-flow model of CH₄; thus, the authors were forced to develop a separate model to project the path of radiative forcing from a CH₄ perturbation, and then incorporate this path into the IAM exogenously. As a result, indirect or feedback effects are missed. For instance, climate change impacts on agriculture will affect methane emissions.

In sum, no approach is perfect but in my opinion, the “direct” approach used by Marten et al is preferred to the indirect GWP approach for the reasons outlined in the review document. However, the EPA should continue to seek improvements to the direct approach put forth by Marten et al.

5. Are there other existing approaches for monetizing the benefits (or dis-benefits) to society from reductions (increases) in CH₄ emissions that should be considered in regulatory analysis?

My complaint with past SC measures is the use of highly aggregated and stylized models to monetize the benefits of reductions. By using models that represent the global economy as one aggregate sector, we are missing important subsector interactions and distributional effects that can only be captured with a more disaggregated model, such as a computable general equilibrium model. My sense would be that these SC would be much higher if a more disaggregated model was used. Modeling the economy as one monolithic sector implies, for instance, perfect substitutability across subsectors which will underestimate the cost of damages. It also assumes perfect trade which can also underestimate the cost of damages. (See Chapter 6 of the IPCC WGIII Fifth Assessment Report which highlights some of these biases that arise with alternative model characteristics).

The use of these simplified models for SC estimates, I believe, is a large source of the criticisms we’ve seen with respect to the SCC reports. The use of more sophisticated economic models (like those used in the IPCC) is needed, in my opinion.

6. Although the focus of this review is on the application of estimates of the social cost of CH₄ to benefit-cost analysis for regulations, do your answers for the questions above hold for the application of the social cost of N₂O estimates provided in Marten et al.?

Yes.

7. Are there implementation issues not addressed in the paper that EPA should consider before applying the Marten et al. estimates in regulatory analysis?

I am not sure I would characterize these as “implementation” issues, but I do want to take this opportunity to stress the importance of being forthcoming with the shortcomings of these SC estimates. These shortcomings are not specific to any gas.

- (1) As discussed in my response to question 1, these estimates are not appropriate for evaluating large (non-marginal) changes in emissions of any of these gases.*
- (2) As discussed in my response to question 5, the SC values will be underestimated due to the use of highly aggregated models.*
- (3) These estimates do not take into account extreme or threshold events, which could amplify the estimates significantly.*
- (4) These estimates will be biased downward due to the omissions of nonmarket values and omitted impacts, and will be biased upward due to the lack of adaptation responses (although FUND does account for some of this).*

To: Beauvais, Joel[Beauvais.Joel@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov];
Marten, Alex[Marten.Alex@epa.gov]
Cc: Kime, Robin[Kime.Robin@epa.gov]
From: McGartland, Al
Sent: Mon 6/22/2015 8:50:46 PM
Subject: RE: SCC

Yep. Also, if needed, we can bug Laity/Josh at our level.

From: Beauvais, Joel
Sent: Monday, June 22, 2015 2:39 PM
To: McGartland, Al; Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: SCC

Hi, folks – Can you keep me posted on any new info as it becomes available regarding materials for, or timing of, the SCC RTC etc. announcement? I will stay in touch with Katie and Rick Duke on this and will keep you posted on anything I hear, but now that Alex B has left the bldg, please stay in touch with me directly on this.

Joel

To: Beauvais, Joel[Beauvais.Joel@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]
From: McGartland, Al
Sent: Wed 6/24/2015 6:15:00 PM
Subject: Re: Draft SCC Blog

Agree. We will try.

Sent from my iPhone

> On Jun 24, 2015, at 1:50 PM, Beauvais, Joel <Beauvais.Joel@epa.gov> wrote:
>
> rollout.
>

To: Shouse, Kate[Shouse.Kate@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
Cc: Li, Jia[Li.Jia@epa.gov]; McFarland, James[McFarland.James@epa.gov]; Sarofim, Marcus[Sarofim.Marcus@epa.gov]
From: Fawcett, Allen
Sent: Thur 4/23/2015 1:30:55 PM
Subject: RE: IAMs and peer review editorial and letters
[Critical Review of the AMPERE study - TFSC - Feb 2015.pdf](#)
[The economics of mitigating climate change - What can we know Final pu....pdf](#)
[Scientific Critique of Beyond 2020 report - March 2014.docx](#)

I think the Rosen letter is actually targeted at the broader class of IAMs. Here are some papers he recently sent out to the IAMC listserv critiquing IAMs (and particularly EMF 28 and the AMPERE project), along with the emails he sent out to the IAMC.

Allen

From: Rich Rosen [mailto:rrosen@tellus.org]
Sent: Monday, March 23, 2015 10:58 AM
To: Rich Rosen
Subject: FW: Important information requested about your IAM-based research

Dear IAMC colleagues,

To the colleagues who responded to the request below, I extend my thanks. To those who have yet to respond, please note that I will have no other choice in the appendix of the review article I am to report cases of no or poor response. So please make responding to this request for vital information about your IAMs your first priority this week. Thanks, again.

Sincerely,

Rich Rosen

From: Rich Rosen [mailto:rrosen@tellus.org]
Sent: Thursday, March 05, 2015 10:57 AM
To: Rich Rosen; Edeltraud Guenther (edeltraud.guenther@tu-dresden.de)
Subject: Two new critical reviews on the economics of climate change

Dear Colleagues,

We are sending you these two new papers which contain fairly strong criticisms of the scientific basis for various claims made in recent publications about issues surrounding the mitigation of climate change over the long run. We have raised many of these issues with many of you previously in informal and formal discussions at IAMC meetings, but we feel that sufficient attention has not yet been paid to them. We hope these papers help start a more fruitful debate as to what extent existing IAMs can usefully serve the climate change policy community, and other research communities. In addition, we have attached our older paper on issues dealing with uncertainty.

Best regards to all,

Richard Rosen and Edeltraud Guenther

From: Rich Rosen
Sent: Tuesday, February 17, 2015 2:12 PM
To: Rich Rosen
Subject: Important information requested about your IAM-based research

Dear IAMC colleagues,

For a review article I am writing about integrated assessment modeling of the economics of

mitigating climate change, I would greatly appreciate it if you would provide me with the following information listed below by replying to this email. I realize that your time is very valuable, but it is very important that you provide me with this information so that my review article can be as truthful, comprehensive, and accurate as possible. If you do not provide the relevant information that exists about your integrated assessment model and research history as applicable to analyzing the economics of mitigating climate change, I will probably have to indicate this fact in my article.

1. Electronic links to the most up-to-date and accurate documentation that exists of that version of your integrated assessment model that has been utilized for recently published research articles. This documentation should hopefully provide the model equations, input parameter values and the sources for those numbers, and internal model parameter values and how they were derived, whenever that information exists. (Or you could email pdf or other files of this material if electronic links do not exist.)
2. Links to, or pdf files of, the major research articles or reports published by you, or your research team, in the last five years, which rely on results from your integrated assessment models.
3. Any journal peer reviews, or other publicly available reviews or discussions of any kind that have been conducted of your model or of sub-modules within your overall model. (Please provide electronic links to or files of this material.)
4. Links to, or files of, any reviews or critiques that your research team has done of any other IAMs or research papers based on them.

Please provide this information by 10 March 2015. Thank you very much. I know that providing this material may take a little work, but I think that the entire IAM Consortium community will benefit by having the facts about the current state of integrated assessment modeling usage, models, and model reviews and critiques as clear, comprehensive, and precise as possible. And doing this ought to facilitate the work of the scientific working groups of the IAMC. Again, I am only requesting materials that already exist, and I am not requesting that any new work be done to create these materials.

Sincerely,

Richard A. Rosen, Ph.D.

Senior Fellow
Tellus Institute
Boston, MA 02116
617-266-5400 x16

From: Shouse, Kate
Sent: Thursday, April 23, 2015 9:09 AM
To: Newbold, Steve; Wolverton, Ann; Kopits, Elizabeth; Marten, Alex; Griffiths, Charles
Cc: Fawcett, Allen; Li, Jia; McFarland, James; Sarofim, Marcus
Subject: RE: IAMs and peer review editorial and letters

Thanks, Steve. OAR team, FYI. I'm going to pull together a high-level summary for OAR management by the end of this week on the recent IAM publications and happy to send to OP if there's interest.

It looks like the Pindyck 2015 working paper on IAMs was submitted to a REEP symposium; he cites two other papers in this symposium, one by Metcalf and Stock and the second by Weyant. I found Metcalf and Stock, http://belfercenter.ksg.harvard.edu/files/dp68_metcalf-stock.pdf, and assume some version of this will be published in REEP. Does anyone have copy of the Weyant paper (citation below)? This is separate from his IAM paper published in the JBCA special issue. Thanks!

Weyant, John. "Contributions of Integrated Assessment Models," Review of Environmental Economics and Policy, 2015 (same issue as Pindyck's paper).

From: Newbold, Steve
Sent: Thursday, April 23, 2015 7:14 AM
To: Wolverton, Ann; Kopits, Elizabeth; Marten, Alex; Griffiths, Charles; Shouse, Kate
Cc: McGartland, Al; Barron, Alex
Subject: IAMs and peer review editorial and letters

FYI:

From Nature Climate change, on IAMs and peer review

(On a first skim, I gather that the editorial and letter by Rosen are referring to IAMs that can be used to calculate the SCC—DICE, FUND, etc.—while the letter by Smith et al are referring to the broader class of IAMs that are often used for cost effectiveness analysis and regularly feature in the EMF exercises.)

Steve Newbold
U.S. EPA
National Center for Environmental Economics (NCEE)
EPA West, 4316T, MC 1809T
1200 Pennsylvania Ave NW
Washington, DC 20004
(202) 566-2293

To: Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Evans, DavidA[Evans.DavidA@epa.gov]
Cc: Matthew_Ranson@abtassoc.com[Matthew_Ranson@abtassoc.com]
From: Heninger, Brian
Sent: Tue 3/10/2015 12:50:11 PM
Subject: FYI - Pieces on CPP with Carbon Prices

FYI – CPP & SCC Folks,

I'm sure you guys saw this, but none-the-less, just in case.....

Interesting pieces on Clean Power Plan and connection with Carbon Prices (From *ClimateWire* and *EnergyWire*.)

<http://www.eenews.net/climatewire/2015/03/05/stories/1060014518>

In carbon-pricing model, PJM states benefit from sharing Clean Power Plan burdens

Emily Holden, E&E reporter

Published: Thursday, March 5, 2015

States that are better-situated to meet carbon emission levels under the Clean Power Plan still might suffer from higher compliance costs if they don't work with their neighbors, according to an economic analysis by the PJM Interconnection.

"State-by-state compliance options, compared to regional compliance options, likely would result in higher compliance costs for most PJM states," according to a report from the regional grid organization, which serves 13 states in or near the Mid-Atlantic and Midwestern regions, as well as the District of Columbia. "This is because there are fewer low-cost options available within state boundaries than across the entire region."

U.S. EPA's Clean Power Plan asks states to write their own plans to reduce electricity-sector emissions by differing amounts, either working alone or together.

Because the electric grid is so interconnected, the study implies that states with lower compliance costs might still see higher regional electricity prices if they don't share carbon-reducing resources with states that are working toward tougher goals.

"The implication is that even though the ... regional compliance scenario resulted in a CO2 price of zero, and some states on an individual basis also have a CO2 price of zero, there is still a cost in the form of higher [locational marginal price] and load energy payments to all states by choosing individual state compliance," according to state-level data.

PJM's study instituted a carbon price to predict the impact of the Clean Power Plan in 17 scenarios, examining varying levels of renewable resources, energy efficiency, natural gas prices, nuclear generation and new natural gas combined-cycle units. The report looked at the cost of achieving mass-based targets, or caps on the amount of carbon dioxide that states would emit.

The report says the modeling can be compared to an emissions tax or a system for states to swap credits for emissions or reductions. Either way, compliance would be ensured for the whole region.

McConnell urges states to defy EPA

PJM operates in 14 jurisdictions: Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. At least four states -- Indiana, Illinois, Ohio and West Virginia -- would not meet their mass targets for 2020 if they tried to comply individually.

Under the regional modeling, some states would offset other states' emissions to bring down costs overall.

Kentucky, for example, has less stringent goals than other coal-intensive states. In a regional scenario, it would overshoot its target by 5 million to 8 million tons of carbon emissions by 2029, enabling it to offset emissions in states that fall short of their individual goals.

PJM and other grid organizations have for months been encouraging states to overcome politics and work together to comply with the proposed rule. The research, though, is not meant to advocate particular policy positions.

The findings seem to support arguments for regional compliance, but they also highlight a key obstacle: persuading states with less stringent goals to be part of a multistate compliance plan.

The incentives for regional cooperation may not be enough to overcome the political dynamics in coal-dependent Kentucky -- a state that has enacted a law deeming the regulation illegal and limiting compliance options.

State officials in Kentucky have said they might not need to do anything to comply and may be able to rely on already-planned coal plant shutdowns to reach required emissions levels by 2030 (*Greenwire*, March 4). And Kentucky's Mitch McConnell, majority leader of the U.S. Senate, wrote an op-ed this week urging other states to refuse to comply with the Clean Power Plan (*Greenwire*, March 4).

Given the political environment, it could be difficult to bring states like Kentucky on board with a regional solution, like a carbon tax or trading system.

PJM analysis of EPA Clean Power Plan puts price on carbon

Rod Kuckro, E&E reporter

Published: Thursday, March 5, 2015

A new analysis of the economic impacts of U.S. EPA's Clean Power Plan by the nation's largest grid operator places a price on carbon dioxide emissions and concludes that under nearly 40 compliance scenarios, a regional solution is less costly than a state-by-state approach.

The model employed by the PJM Interconnection in its analysis also concludes that the retirement of fossil-fueled power plants "will occur gradually" through the 2030 deadline for compliance with the EPA plan.

Running the scenarios through the complex model took more than two months of computational clock time, PJM said.

The analysis was requested by the Organization of PJM States Inc., a group made up of the regulators from the 14 jurisdictions served wholly or in part by PJM -- Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. It was accompanied by an analysis that offers state-level details.

"State-by-state compliance options -- compared to regional compliance options -- likely would result in higher compliance costs for most PJM states because there are fewer low-cost options available within state boundaries than across the entire region," the analysis said. Also, states acting individually "would increase the amount of capacity at risk for retirement because some states would likely face higher CO2 prices" in an individual approach, PJM said.

"Our states have recognized the value of being part of the larger regional [electric power] dispatch, and they're interested in understanding what the implications would be of going on your own versus participating in the region," Michael Kormos, PJM's executive vice president for operations, said in an interview.

The model PJM used to look at both regional and state-by-state compliance "is a representation of how the market is currently dispatched," with least-cost resources being called on for power to meet the electricity needs of the more than 61 million people in PJM's footprint, Kormos said.

For assessing the costs of regional versus state-by-state compliance, the model results in a single price expressed in dollars per ton of CO2 emissions that applies across the entire PJM footprint.

The carbon price "is akin to an emissions tax that is adjusted iteratively to ensure that the region served by PJM achieves" its target, the analysis said. The price easily allows emissions or emission reductions to be exchanged between affected generating units and across states, and the cost of CO2 emissions is treated as an input cost to electricity production, similar to other variable costs such as fuel or operations and maintenance expenses.

A somewhat counterintuitive finding by PJM was that "adding more energy efficiency and renewable energy and retaining more nuclear generation likely would lead to lower CO2 prices and could result in fewer megawatts" of fossil-fueled units at risk of retirement.

"With the renewables and nuclear coming in as basically carbon free, we're actually able to run those coal resources more," Kormos explained, because they are "getting credit from the renewables and the nuclear as zero carbon."

The analysis found that roughly 6,000 megawatts of mostly coal-fired power plants "at some point along the way" to the CPP deadline of 2030 "will most likely retire no matter what," Kormos said.

Roughly 16,000 MW of units make up a middle scenario of plants that are likely to retire, and, under the worst-case scenario, unit retirements are projected to be as high as 31,000 MW, he said. As of December, PJM had a total of 183,604 MW of generation, of which 67,749 MW are coal-fired units.

The economic analysis is feeding into a "well underway" analysis of the reliability implications of compliance with the EPA plan, Kormos said.

"Right now, we're running those retirements through our normal transmission analysis to look at ultimately what would be the upgrades we would need to be put in place to handle those units retiring and the timing of those upgrades. We'll also start to look overall at the ability to replace that capacity, what the timeline of that would look like," Kormos said.

Original PJM Analysis

http://www.eenews.net/assets/2015/03/04/document_ew_01.pdf

PJM Interconnection Economic Analysis of the EPA Clean Power Plan Proposal

March 2, 2015

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: Marten, Alex
Sent: Mon 4/20/2015 1:25:09 PM
Subject: FW: New Pindyck NBER WP on the use of IAMs
[Pindyck - IAMs \(NBER WP 21097-2\).pdf](#)

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Shadbegian, Ron
Sent: Monday, April 20, 2015 9:02 AM
To: Wolverton, Ann; McGartland, Al; Marten, Alex; Garbaccio, Richard
Subject: New Pindyck NBER WP on the use of IAMs

Abstract

In recent articles, I have argued that integrated assessment models (IAMs) have flaws that make them close to useless as tools for policy analysis. IAM-based analyses of climate policy create a perception of knowledge and precision that is illusory, and can fool policy-makers into thinking that the forecasts the models generate have some kind of scientific legitimacy. But some have claimed that we need some kind of model, and that IAMs can be structured and used in ways that correct for their shortcomings. For example, it has been argued that although we know little or nothing about key relationships in the model, we can get around this problem by attaching probability distributions to various parameters and then simulating the model using Monte Carlo methods. I argue that this would buy us nothing, and that a simpler and more transparent approach to the design of climate change policy is preferable. I briefly outline what that approach would look like.

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: Marten, Alex
Sent: Mon 4/20/2015 1:25:09 PM
Subject: FW: New Pindyck NBER WP on the use of IAMs
[Pindyck - IAMs \(NBER WP 21097-2\).pdf](#)

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Shadbegian, Ron
Sent: Monday, April 20, 2015 9:02 AM
To: Wolverton, Ann; McGartland, Al; Marten, Alex; Garbaccio, Richard
Subject: New Pindyck NBER WP on the use of IAMs

Abstract

In recent articles, I have argued that integrated assessment models (IAMs) have flaws that make them close to useless as tools for policy analysis. IAM-based analyses of climate policy create a perception of knowledge and precision that is illusory, and can fool policy-makers into thinking that the forecasts the models generate have some kind of scientific legitimacy. But some have claimed that we need some kind of model, and that IAMs can be structured and used in ways that correct for their shortcomings. For example, it has been argued that although we know little or nothing about key relationships in the model, we can get around this problem by attaching probability distributions to various parameters and then simulating the model using Monte Carlo methods. I argue that this would buy us nothing, and that a simpler and more transparent approach to the design of climate change policy is preferable. I briefly outline what that approach would look like.

To: [Redacted] **Ex 4**, Griffiths,
Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Heninger, Brian
Sent: Thur 4/16/2015 2:46:19 PM
Subject: More SCC News

Just FYI – in case you haven't seen these two news articles.

➤ **BLM crafting guidance on social cost of carbon -- internal memo**

➤ **Support for carbon tax reaches almost 70%**

<http://www.eenews.net/greenwire/2015/04/15/stories/1060016810>

BLM crafting guidance on social cost of carbon -- internal memo

Phil Taylor, E&E reporter

Published: Wednesday, April 15, 2015

The Bureau of Land Management is developing comprehensive guidance on calculating the climate change impacts of mining oil, gas and coal from public lands, according to an internal memo obtained by *Greenwire*.

The **memo**, sent this month by Ed Roberson, BLM's assistant director of resources and planning, says the rapid warming of the planet is primarily caused by humans and that BLM should acknowledge this as it weighs the trade-offs of extracting more carbon-intensive minerals from the earth.

"Anthropogenic climate change is a reality," Roberson wrote in an email to BLM senior managers across the country. "Please ensure that all discussions of climate change in BLM's [National Environmental Policy Act] documents are consistent with this conclusion."

Roberson's name does not appear in the document, but the agency confirmed he was the author and that it was sent earlier this month.

The memo says BLM will be issuing "a comprehensive instruction memorandum" addressing climate change and the social cost of carbon in the next few months.

While the impact of that guidance remains unclear, environmentalists said Roberson's memo is a sign that the agency intends to take better stock of how its land management decisions affect the climate.

"This is the most authoritative statement from BLM on the reality of climate change," said Jeremy Nichols, who oversees climate and energy programs at WildEarth Guardians. "With the Obama administration putting its weight behind climate action, leasing more coal and oil and gas is definitely a liability."

A BLM official today said the memo is consistent with new draft guidance issued last December by the White House Council on Environmental Quality that addressed how federal agencies should consider greenhouse gas emissions and the impacts of climate change when conducting NEPA reviews (*E&ENews PM*, Dec. 18, 2014).

"That guidance emphasizes that agency analyses should be commensurate with projected greenhouse gas emissions and climate impacts and should employ appropriate qualitative and quantitative analytical methods to ensure useful information is available to the public and the decisionmaking process," the BLM official said.

The memo comes one month after an analysis by the liberal Center for American Progress found that the burning of oil, gas and coal from public lands and waters accounts for more than one-fifth of domestic greenhouse gas emissions (*Greenwire*, March 19). BLM manages roughly 250 million acres of public lands and is in charge of deciding which publicly owned minerals are leased to private industry and at what cost.

Roberson's memo may be a response to a decision last September by a federal district judge in Colorado that faulted BLM for failing to account for greenhouse gas emissions when it approved an Arch Coal Inc. mine expansion in a roadless area of the Gunnison National Forest (*Greenwire*, Sept. 17, 2014).

Environmentalists said that ruling will force BLM and the Forest Service to pay more attention to climate concerns when reviewing coal lease decisions under the National Environmental Policy Act.

Roberson's memo seems to acknowledge the need for a consistent approach to gauging mining's impacts on the climate.

In particular, it promises national guidance on how to use a controversial Obama administration tool known as the social cost of carbon (SCC).

The SCC, which the Obama administration first developed in 2010, seeks to estimate the incremental cost of releasing a ton of man-made carbon dioxide into the atmosphere when it comes to property damage, health care costs, lost agricultural output and other factors. The administration sparked a controversy in 2013 when it increased its SCC estimate to \$38 per metric ton, up from a 2010 estimate that would have set it at \$24.

While it is not a rule itself, the SCC has figured in numerous rulemakings, including U.S. EPA's Clean Power Plan for existing power plants. Opponents of SCC, namely congressional Republicans, have argued that the administration uses the figure to justify the cost of its rules and claim it is the product of a flawed and nontransparent process.

In the Colorado coal leasing case, Judge R. Brooke Jackson said regulators had to at least explain why they were opting against using the SCC calculation.

According to Roberson's memo, some BLM field offices have included estimates of the SCC in project-level NEPA documents.

"We are working on additional guidance for the field," he said.

But until then, if BLM field managers want to include the SCC in NEPA decisions, they are to contact BLM's headquarters in Washington, D.C., "for technical assistance," Roberson wrote.

Nichols, of WildEarth Guardians, said BLM field offices have inconsistently accounted for climate change in their land management decisions. For example, BLM's Idaho office included a SCC for its May lease sale, finding in its environment assessment in February that burning those minerals could result in \$3.7 million annually in carbon costs. But other BLM offices appear to be dismissing the impacts of greenhouse gas emissions from public lands, he said.

According to Roberson's memo, BLM in August 2014 sent an email to state directors with informal interim guidance on treatment of climate change and the social cost of carbon. That email has not been made public.

BLM in 2011 also circulated draft direction to the field on the use of quantitative greenhouse gas emissions and sequestration estimates and qualitative discussions of climate change impacts in NEPA documents. Roberson's memo indicates that that direction remains in effect.

Last month, former Interior Deputy Secretary David Hayes and former White House Council of Economic Advisers member James Stock penned an op-ed in *The New York Times* calling on the Obama administration to boost its scrutiny of federal coal leases, plus add the social cost of burning coal to the price of allowing mining companies to extract the fuel from public land.

Reporters Manuel Quiñones and Jean Chemnick contributed

<http://www.eenews.net/climatewire/2015/04/16/stories/1060016859>

Support for carbon tax reaches almost 70%

Evan Lehmann, E&E reporter

Published: Thursday, April 16, 2015

A large majority of Americans support taxing carbon emissions, according to polling results released yesterday, and favorability rises to two-thirds if the tax is used to send money back to households.

The survey by Stanford University and Resources for the Future also found that efforts by environmental organizations to increase urgency around climate change by pointing to extreme weather isn't working, and neither are efforts to erode people's belief in global warming by questioning the science.

"There is really no evidence here at all that the disinformation campaign has successfully, dramatically reduced confidence in environmental scientists," said Jon Krosnick, a Stanford professor who oversaw the poll.

He points to consistent levels of trust in climate scientists since 2006, when the survey first asked the question. In the latest poll, 71 percent of respondents say they trust scientists at least moderately. Nine years ago, the number was 72 percent.

On a carbon tax, the poll found that 61 percent of respondents favor taxing corporations for releasing greenhouse gas emissions. There's stronger support for a carbon tax that provides rebates to American households; 67 percent agree with that policy.

That roughly equates to a revenue-neutral carbon tax, which is being promoted among a small but growing number of Democratic lawmakers and conservative think tanks. The policy is based on the idea that national tax revenue will stay the same with the introduction of a carbon tax, because other taxes, like those on income or corporations, will be reduced.

"We're tremendously encouraged," Charles Komanoff, director of the Carbon Tax Center, said of the poll's findings. "We're not dumbstruck by it, because we've been sensing a shift in opinion that the tide is moving our way. But it's fantastic to get this kind of confirmation."

The Niskanen Center is a new proponent of taxing carbon. The libertarian group recently proposed a plan to swap out U.S. EPA's Clean Power Plan for a revenue-neutral carbon tax. One of its key arguments is based on the idea that carbon pricing is a political reality and conservatives could be left on the sidelines if they continue to question the science behind climate change.

Public is willing; Congress is not

Jerry Taylor, president of the Niskanen Center, said the poll shows that "the public is willing to pay a price" to reduce emissions. He said it's notable that respondents showed strong support for a carbon tax that doesn't give rebates to the public.

"It speaks to greater public concern about climate change than some people would like to admit, and that people don't need to be bribed into taking action to reduce greenhouse gas emissions," Taylor said.

As for a swap, Komanoff estimates that the Clean Power Plan could be replaced fairly cheaply. He calculates that a \$2.15-per-ton carbon tax could result in the same level of emission reductions as the EPA power plant rules, which are expected to be released this summer. The tax would rise by \$2.15 every year until 2030, and it would only cover emissions from the electricity sector.

"That speaks not to how great a carbon tax is, but rather how meager the Clean Power Plan target is," Komanoff said.

Most experts suggest that a carbon tax would begin at about \$20 a ton and go up annually, potentially resulting in much deeper cuts to carbon emissions than the Clean Power Plan.

Despite the poll's finding of support for a carbon tax, the policy's favorability could tumble if it were ever debated in Congress, Taylor said. He noted that Americans generally support higher taxes on corporations, whether it's related to climate change or not.

In the real world, political opponents of taxing carbon -- or taxing anything -- would argue that Americans would ultimately pay the increased costs placed on corporations, he said.

"It's very easy for people to say, 'Sure, some other guy should be paying a lot of money to reduce greenhouse gas emissions,'" Taylor said. "For whatever reason, it's not always obvious to the public that taxing corporations will likely result in those higher tax bills being passed onto consumers in higher energy prices."

Want GOP votes? Embrace climate change

Sen. James Inhofe (R-Okla.), chairman of the Environment and Public Works Committee, underlines that point. He said in a statement that a carbon tax would fall especially hard on poor and fixed-income Americans, because they use a larger percentage of their income on energy than wealthier households.

"These policies have long been about courting an extremist agenda from environmentalists and expanding government control into every facet of American life," said Inhofe, who rejects the idea that humans are changing the environment.

But Krosnick says that's not a message that most voters are eager to hear.

Poll findings unveiled in January, prior to yesterday's wider release, revealed that 66 percent of respondents were more likely to vote for a political candidate who believes that humans are responsible for rising temperatures and wants to address it. Twelve percent said they would be less likely to vote for that candidate, and 21 percent said the candidate's views had no effect on their decision.

Alternatively, the poll found that 67 percent of respondents would be less likely to vote for someone who calls climate change a hoax. Thirteen percent would be more likely to support that candidate. Finally, 44 percent said they would be less likely to support someone who says, "I am not a scientist," when asked about global warming, while 27 percent would be more likely.

The attitudes of partisans are more telling. For example, twice as many Republicans said they would vote for a green candidate than those who said they wouldn't. Forty-eight percent of Republicans support candidates who believe in man-made global warming, compared with 24 percent who don't.

"If a Democrat wants to win by recruiting some Republican votes, this is a good way to do it," Krosnick said. "They will win more than they lose."

In a finding that's perhaps more relevant, the poll found that 64 percent of independents were more likely to vote for a green candidate, compared with 13 percent who were less likely to give their support.

The survey also suggests that efforts to raise awareness about climate change by pointing to extreme weather isn't working.

The poll found that attitudes about droughts, storms and unstable weather have stayed steady since 2012, despite the occurrence of record heat in the West and record cold in the East.

Fifty-four percent of respondents say global warming has caused more drought, while 55 percent say it's resulted in more storms. Those numbers are unchanged from previous surveys, Krosnick said, suggesting that strategies stressing weather risks have been unpersuasive.

To: Marten, Alex[Marten.Alex@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: Evans, DavidA
Sent: Thur 4/2/2015 9:11:43 PM
Subject: FW: The Promise and Pitfalls of Determining the Cost of Carbon

Suspect you all know about, but if not...

-----Original Message-----

From: elisite@server2.environmentallawinstitute.com
[mailto:elisite@server2.environmentallawinstitute.com] On Behalf Of Environmental Law Institute
Sent: Thursday, March 26, 2015 3:19 PM
To: Evans, DavidA
Subject: The Promise and Pitfalls of Determining the Cost of Carbon

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34011&qid=911312>>
Measuring the Social Cost of Carbon: The Promise and Pitfalls of Using the SCC to Justify Regulation
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34012&qid=911312>>

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34013&qid=911312>>

For more info click here

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34012&qid=911312>>

When:

March 31, 2015
12:00 pm - 1:30 pm

Where:

D.C. Bar Conference Center
1101 K Street, NW (Metro Center Station) Washington, DC

RSVP <<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34013&qid=911312>>

This event is open to the public, but you must register with the DC Bar HERE
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34013&qid=911312>> . There is a \$5-\$20
fee for all attendees (except law students). In-person attendees may bring a brown-bag lunch.
All times noted are Eastern Time.

Not an ELI member? Join today and start receiving your benefits!

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34014&qid=911312>>

Next time you shop at Amazon, please log on to smile.amazon.com

To: Marten, Alex[Marten.Alex@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: Evans, DavidA
Sent: Thur 4/2/2015 9:11:43 PM
Subject: FW: The Promise and Pitfalls of Determining the Cost of Carbon

Suspect you all know about, but if not...

-----Original Message-----

From: elisite@server2.environmentallawinstitute.com
[mailto:elisite@server2.environmentallawinstitute.com] On Behalf Of Environmental Law Institute
Sent: Thursday, March 26, 2015 3:19 PM
To: Evans, DavidA
Subject: The Promise and Pitfalls of Determining the Cost of Carbon

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34011&qid=911312>>
Measuring the Social Cost of Carbon: The Promise and Pitfalls of Using the SCC to Justify Regulation
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34012&qid=911312>>

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34013&qid=911312>>

For more info click here

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34012&qid=911312>>

When:

March 31, 2015
12:00 pm - 1:30 pm

Where:

D.C. Bar Conference Center
1101 K Street, NW (Metro Center Station) Washington, DC

RSVP <<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34013&qid=911312>>

This event is open to the public, but you must register with the DC Bar HERE
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34013&qid=911312>> . There is a \$5-\$20
fee for all attendees (except law students). In-person attendees may bring a brown-bag lunch.
All times noted are Eastern Time.

Not an ELI member? Join today and start receiving your benefits!

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34014&qid=911312>>

Next time you shop at Amazon, please log on to smile.amazon.com

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34015&qid=911312>> and choose ELI as your charity of choice.

Connect With Us!

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34016&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34017&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34018&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34019&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34020&qid=911312>>

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34021&qid=911312>>
The Social Cost of Carbon tool assesses the economic costs of greenhouse gas emissions. Our panel of experts will offer a primer on the tool and debate the advantages and shortcomings of relying on it as a factor in agency decision-making.

Richard Ayres is among the nation's most knowledgeable and well-respected environmental attorneys and policy makers. He has significantly shaped the country's environmental policies, including the Clean Air Act, and their implementation.

Dr. Kevin D. Dayaratna specializes in tax, energy and health policy issues as Senior Statistician and Research Programmer in The Heritage Foundation's Center for Data Analysis (CDA). An applied statistician, he has researched and published on the use of high-powered statistical models in public policy.

Dr. Laurie Johnson is the chief economist at NRDC's climate and clean air program in Washington, DC. She focuses on modeling the costs and benefits of reducing greenhouse gas emissions, the impacts of environmental regulation on employment, economic analyses of regulation by industry, and macroeconomic modeling of climate change legislation and its distributional impacts.

Patrick Traylor practices in the area of environmental law, with a particular focus on the Clean Air Act, environmental litigation, and energy infrastructure development and climate change.

Speakers:

Richard Ayres, co-founder of the Natural Resources Defense Council, managing partner, Ayres Law Group LLP Dr. Kevin Dayaratna, Heritage Foundation Dr. Laurie Johnson, Natural Resources Defense Council Patrick Traylor, partner, Hogan Lovells Jessica Olson, Ayres Law Group LLP (moderator)

This brown bag program is sponsored by the Air Quality Committee of the D.C. Bar Environment, Energy and Natural Resources Section, in cosponsorship with the following additional D.C. Bar Section(s): Administrative Law and Agency Practice Section, the ABA, Section of Environment, Energy, and Resources, and the Environmental Law Institute. Doors open at 11:30 a.m.

Unsubscribe

<<http://www.eli.org/civicrm/mailling/unsubscribe?reset=1&jid=1933&qid=911312&h=705e38faf3683e10>> from ELI bulk marketing emails Unsubscribe
<<http://www.eli.org/civicrm/mailling/optout?reset=1&jid=1933&qid=911312&h=705e38faf3683e10>> from all ELI bulk emails including ELR Update and ELR N&A

Environmental Law Institute. Copyright 2015

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34015&qid=911312>> and choose ELI as your charity of choice.

Connect With Us!

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34016&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34017&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34018&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34019&qid=911312>>
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34020&qid=911312>>

<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34021&qid=911312>>
The Social Cost of Carbon tool assesses the economic costs of greenhouse gas emissions. Our panel of experts will offer a primer on the tool and debate the advantages and shortcomings of relying on it as a factor in agency decision-making.

Richard Ayres is among the nation's most knowledgeable and well-respected environmental attorneys and policy makers. He has significantly shaped the country's environmental policies, including the Clean Air Act, and their implementation.

Dr. Kevin D. Dayaratna specializes in tax, energy and health policy issues as Senior Statistician and Research Programmer in The Heritage Foundation's Center for Data Analysis (CDA). An applied statistician, he has researched and published on the use of high-powered statistical models in public policy.

Dr. Laurie Johnson is the chief economist at NRDC's climate and clean air program in Washington, DC. She focuses on modeling the costs and benefits of reducing greenhouse gas emissions, the impacts of environmental regulation on employment, economic analyses of regulation by industry, and macroeconomic modeling of climate change legislation and its distributional impacts.

Patrick Traylor practices in the area of environmental law, with a particular focus on the Clean Air Act, environmental litigation, and energy infrastructure development and climate change.

Speakers:

Richard Ayres, co-founder of the Natural Resources Defense Council, managing partner, Ayres Law Group LLP Dr. Kevin Dayaratna, Heritage Foundation Dr. Laurie Johnson, Natural Resources Defense Council Patrick Traylor, partner, Hogan Lovells Jessica Olson, Ayres Law Group LLP (moderator)

This brown bag program is sponsored by the Air Quality Committee of the D.C. Bar Environment, Energy and Natural Resources Section, in cosponsorship with the following additional D.C. Bar Section(s): Administrative Law and Agency Practice Section, the ABA, Section of Environment, Energy, and Resources, and the Environmental Law Institute. Doors open at 11:30 a.m.

Unsubscribe

<<http://www.eli.org/civicrm/mailling/unsubscribe?reset=1&jid=1933&qid=911312&h=705e38faf3683e10>> from ELI bulk marketing emails Unsubscribe
<<http://www.eli.org/civicrm/mailling/optout?reset=1&jid=1933&qid=911312&h=705e38faf3683e10>> from all ELI bulk emails including ELR Update and ELR N&A

Environmental Law Institute. Copyright 2015

1730 M Street, NW
Suite 700
Washington, DC 20036
United States
202.939.3800 | www.eli.org
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34011&qid=911312>>

<<http://www.eli.org/sites/all/modules/civicrm/extern/open.php?q=911312>>

1730 M Street, NW
Suite 700
Washington, DC 20036
United States
202.939.3800 | www.eli.org
<<http://www.eli.org/sites/all/modules/civicrm/extern/url.php?u=34011&qid=911312>>

<<http://www.eli.org/sites/all/modules/civicrm/extern/open.php?q=911312>>

To: Li, Jia[Li.Jia@epa.gov]
Cc: Wolverton, Ann[Wolverton.Ann@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Fawcett, Allen[Fawcett.Allen@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: Kopits, Elizabeth
Sent: Mon 1/12/2015 8:39:24 PM
Subject: RE: New Stanford study showing SCC six times higher than USG estimates
[Moore&Diaz2015.pdf](#)

I hadn't. Thanks for sending. Here's the Nature Climate Change article.

-----Original Message-----

From: Li, Jia
Sent: Monday, January 12, 2015 2:26 PM
To: Kopits, Elizabeth; Shouse, Kate; Fawcett, Allen; Marten, Alex; Newbold, Steve
Subject: New Stanford study showing SCC six times higher than USG estimates

FYI - you may have seen the study

<http://www.rtcc.org/2015/01/12/social-cost-of-carbon-six-times-higher-than-thought-study/>

Sent from my iPhone

To: Matthew Ranson[Matthew_Ranson@abtassoc.com]
Cc: Heninger, Brian[Heninger.Brian@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Bcc: griffiths.charles.epa@gmail.com[griffiths.charles.epa@gmail.com]
From: Griffiths, Charles
Sent: Tue 5/5/2015 7:36:26 PM
Subject: FW: What Do We Learn from the Weather? The New Climate-Economy Literature
Dell et al climate weather JEL 2014.pdf

Hi Matt:

We receive your latest draft. Thanks. As Brian said in his last message, we are figuring out how to proceed. In the meantime, enclosed is a new JEL article on weather and climate that you may have already seen. Please don't do any work on this till Brian gets back to you on where we are, but I wanted to send it to you now while I was thinking about it.

Charles

Charles Griffiths
National Center for Environmental Economics
Room 4334B, WJC West, Mail Code 1809T
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Phone: 202/566-2288 Fax: 202/566-2338
Email: griffiths.charles@epamail.epa.gov

From: Wolverton, Ann

Sent: Tuesday, May 05, 2015 2:38 PM

To: Bowen, Jennifer; Dockins, Chris; Evans, DavidA; Ferris, Ann; Garbaccio, Richard; Griffiths, Charles; Klemick, Heather; Kopits, Elizabeth; Marten, Alex; McGartland, Al; Moore, Chris; Newbold, Steve; Pasurka, Carl; Sargent, Keith; Shadbegian, Ron; Sheriff, Glenn; Simon, Nathalie; Simpson, David; Snyder, Brett

Subject: What Do We Learn from the Weather? The New Climate-Economy Literature

Fairly new survey article in JEL – I haven't read it but thought it might be of interest to folks.

Ann

To: Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Dockins, Chris
Sent: Thur 2/5/2015 2:16:46 PM
Subject: Discounting presentation
Discounting work plan (draft 2-5-15 cd).pptx

Here are my thoughts on it – rough, but you get the idea. I can work on fleshing it out, etc. through the day but wanted your feedback on this direction (and content).

Mostly I put my added slides and text in red.

- C

To: Marten, Alex[Marten.Alex@epa.gov]
Bcc: griffiths.charles.epa@gmail.com[griffiths.charles.epa@gmail.com]
From: Griffiths, Charles
Sent: Fri 3/13/2015 11:42:18 AM
Subject: RE: PAGE help

Yes and happy to help. I should be free all day today (Friday).

Charles Griffiths
National Center for Environmental Economics
Room 4334B, WJC West, Mail Code 1809T
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Phone: 202/566-2288 Fax: 202/566-2338
Email: griffiths.charles@epamail.epa.gov

From: Marten, Alex
Sent: Thursday, March 12, 2015 5:08 PM
To: Griffiths, Charles
Subject: PAGE help

Hi Charles,

There is someone trying replicate the SCC estimates via the PAGE model and is running into some trouble. They had some questions with regards to the GDP input and some of the @Risk settings. I would like to setup a call the week of the 23rd with the three of us to see if we can't work this out.

If you are in tomorrow we should chat more about this.

Thanks.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

To: McGartland, Al[McGartland.Al@epa.gov]; Bowen, Jennifer[Bowen.Jennifer@epa.gov]; Dockins, Chris[Dockins.Chris@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Griffiths, Charles
Sent: Thur 2/5/2015 5:11:32 PM
Subject: Discounting slides
Discounting work plan (draft 2-5-15).pptx

Enclosed is a revised slide deck for the discounting discussion with Joel tomorrow. This reflect recent comments and suggestions by Chris and Alex.

Additional comments are welcome.

Charles

Charles Griffiths
National Center for Environmental Economics
Room 4334B, WJC West, Mail Code 1809T
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Phone: 202/566-2288 Fax: 202/566-2338
Email: griffiths.charles@epamail.epa.gov

From: McGartland, Al
Sent: Monday, February 02, 2015 2:05 PM
To: Bowen, Jennifer; Dockins, Chris
Cc: Griffiths, Charles; Marten, Alex
Subject: econ significance test

Hi. In getting ready for the meeting with Joel on discounting and economic significance, I pulled this slide deck up.

Can you add a page or two on other economic significance tests (UMRA) and put them in context? Thanks.

Charles/chris/-- Do we have a briefing deck for discounting yet?

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Griffiths, Charles
Sent: Wed 1/7/2015 4:04:55 PM
Subject: RE: SCC - NAS draft charge

No comments from me.

From: Kopits, Elizabeth
Sent: Wednesday, January 07, 2015 10:59 AM
To: Beauvais, Joel; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: SCC - NAS draft charge

Hi Joel and Al,

Attached is the revised NAS draft charge, reflecting the edits we discussed yesterday – and NCEE-CEB staff feedback on those edits. I just spoke to Allen and he is sending this version up their chain for Joe and Janet's feedback.

Please let me know if you would like to discuss and/or have any other edits.

Thanks,

Elizabeth

To: Kime, Robin[Kime.Robin@epa.gov]
Cc: McGartland, Al[McGartland.Al@epa.gov]
From: Kopits, Elizabeth
Sent: Mon 1/5/2015 9:09:46 PM
Subject: Re: scc mtg tomorrow

Thanks, Robin. I just left the office and can't see who you added on my phone. I think the folks who should be included are: Kate shouse, Jia li, Allen Fawcett, and maybe Paul gunning.

Thanks!
Elizabeth

Sent from my iPhone

On Jan 5, 2015, at 4:00 PM, "Kime, Robin" <Kime.Robin@epa.gov> wrote:

Hi- Joel is good w/inviting OAR folks- I caught a few but maybe not all names. Thx

To: Shouse, Kate[Shouse.Kate@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Bowen, Jennifer[Bowen.Jennifer@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Kime, Robin
Sent: Wed 7/15/2015 12:27:30 PM
Subject: RE: question from Robin K for website for SCC info

Thank you!

From: Shouse, Kate
Sent: Wednesday, July 15, 2015 8:24 AM
To: Kopits, Elizabeth; Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Hi, everyone. The updates to EPA's SCC website are now live – please see <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> and let me know if you have any questions (or see anything amiss). Thanks!

From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 4:05 PM
To: Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Hi Jenny and Robin,

If you are looking for an EPA website on SCC, it is: <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> . However, I don't think this has been updated yet to reflect the recent revision, etc. Kate Shouse (ccd above) might be able to tell you when we are likely to update it.

However, the 7/2 OMB blog post (<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>) provides the most recent info and includes links

to the current TSD and response to public comments received through the recent OMB comment solicitation.

Hope this helps.

Thanks,

Elizabeth

From: Bowen, Jennifer
Sent: Thursday, July 09, 2015 3:57 PM
To: Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: question from Robin K for website for SCC info

What is the best website to point folks to for more info re: SCC?

Thank you.

Jenny

To: Shouse, Kate[Shouse.Kate@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Bowen, Jennifer[Bowen.Jennifer@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Kime, Robin
Sent: Thur 7/9/2015 8:13:42 PM
Subject: RE: question from Robin K for website for SCC info

Thank you!

From: Shouse, Kate
Sent: Thursday, July 09, 2015 4:12 PM
To: Kopits, Elizabeth; Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Thanks, Elizabeth. We are working to update the EPA website and hope it goes live by end of this week or early next week. I can email everyone on this message once it's finished. The contractor is making changes now; we'll proofread it offline, then press go.

Also, I may be the last one to find this but OMB created an SCC page that consolidates the TSDs, RTC, and all of the relevant blog posts at <https://www.whitehouse.gov/omb/oira/social-cost-of-carbon>. I think the links Elizabeth listed below are the best (pending the update to EPA's site) but wanted to flag this in case others missed it.

Thanks,
Kate

From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 4:05 PM
To: Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Hi Jenny and Robin,

If you are looking for an EPA website on SCC, it is:
<http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> . However, I don't think this has been updated yet to reflect the recent revision, etc. Kate Shouse (ccd above) might be able to tell you when we are likely to update it.

However, the 7/2 OMB blog post (<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>) provides the most recent info and includes links to the current TSD and response to public comments received through the recent OMB comment solicitation.

Hope this helps.

Thanks,

Elizabeth

From: Bowen, Jennifer
Sent: Thursday, July 09, 2015 3:57 PM
To: Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: question from Robin K for website for SCC info

What is the best website to point folks to for more info re: SCC?

Thank you.

Jenny

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Poole, Jacqueline[Poole.Jacqueline@epa.gov]
From: Kime, Robin
Sent: Mon 1/5/2015 9:27:50 PM
Subject: RE: scc mtg tomorrow

Thanks- Jackie, can you add these folks to Joel's SCC meeting tomorrow?

From: Kopits, Elizabeth
Sent: Monday, January 05, 2015 4:10 PM
To: Kime, Robin
Cc: McGartland, Al
Subject: Re: scc mtg tomorrow

Thanks, Robin. I just left the office and can't see who you added on my phone. I think the folks who should be included are: Kate shouse, Jia li, Allen Fawcett, and maybe Paul gunning.

Thanks!

Elizabeth

Sent from my iPhone

On Jan 5, 2015, at 4:00 PM, "Kime, Robin" <Kime.Robin@epa.gov> wrote:

Hi- Joel is good w/inviting OAR folks- I caught a few but maybe not all names. Thx

To: Poole, Jacqueline[Poole.Jacqueline@epa.gov]
Cc: Elizabeth Kopits[kopits.elizabeth@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Bcc: Kime, Robin[Kime.Robin@epa.gov]
From: Kime, Robin
Sent: Mon 1/5/2015 8:06:29 PM
Subject: Meeting for Joel - SCC Draft Charge

Hi

Joel would like to have a 30 min meeting tomorrow (best) or Wednesday (if need be). Below is the info, I'm cc'ing Elizabeth and Alex because they are key for attendance. Thanks

Topic: SCC Draft Charge

Date: suggested- Tuesday 1/6

Time: 1:00-1:30

Location: 3500 WJCN

Required: Elizabeth Kopits <kopits.elizabeth@epa.gov>; Marten, Alex
<Marten.Alex@epa.gov>; McGartland, Al <McGartland.Al@epa.gov>; Newbold, Steve
<Newbold.Steve@epa.gov>; Griffiths, Charles <Griffiths.Charles@epa.gov>; McGartland, Al
McGartland.Al@epa.gov

Thank you

To: Shouse, Kate[Shouse.Kate@epa.gov]; Bowen, Jennifer[Bowen.Jennifer@epa.gov]; Kime, Robin[Kime.Robin@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Kopits, Elizabeth
Sent: Wed 7/15/2015 12:36:23 PM
Subject: RE: question from Robin K for website for SCC info

Thanks, Kate. I think it looks good, and have just one comment.

If/when you can make any edits to it, think it would be nice to also embed a link to the main OMB SCC webpage (<https://www.whitehouse.gov/omb/oira/social-cost-of-carbon>) - maybe at the very end? Right now you have direct links to a few of the documents, but I think a link to the main page would be helpful too in case someone is interested in all versions of the TSD, earlier blog post etc. And presumably, new developments will be added to this same page.

Thanks,

Elizabeth

From: Shouse, Kate
Sent: Wednesday, July 15, 2015 8:24 AM
To: Kopits, Elizabeth; Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Hi, everyone. The updates to EPA's SCC website are now live – please see <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> and let me know if you have any questions (or see anything amiss). Thanks!

From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 4:05 PM
To: Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Hi Jenny and Robin,

If you are looking for an EPA website on SCC, it is:
<http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> . However, I don't think this has been updated yet to reflect the recent revision, etc. Kate Shouse (ccd above) might be able to tell you when we are likely to update it.

However, the 7/2 OMB blog post (<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>) provides the most recent info and includes links to the current TSD and response to public comments received through the recent OMB comment solicitation.

Hope this helps.

Thanks,

Elizabeth

From: Bowen, Jennifer
Sent: Thursday, July 09, 2015 3:57 PM
To: Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: question from Robin K for website for SCC info

What is the best website to point folks to for more info re: SCC?

Thank you.

Jenny

From: Li, Jia
Location: DCRoomWest4424G/OPEI
Importance: Normal
Subject: adaptation and IAMs
Start Date/Time: Tue 8/18/2015 3:00:00 PM
End Date/Time: Tue 8/18/2015 4:00:00 PM
[Wing&Fisher-Vanden conceptual framework IAM and adaptation.pdf](#)
[Fisher-Vanden et al challenges of adaptation modeling.pdf](#)
[deBruin adaptation in DICE model.pdf](#)
[Bosello et al adaptation and mitigation in AD-WITCH 2013.pdf](#)
[energy economics special issue on adaptation introduction.pdf](#)

Hi everyone:

I am putting a meeting on the calendar for discussion of adaptation and IAM research. Please let me know if this time doesn't work for you.

For background, I also attach a few papers that may be relevant to the discussion. The first two papers review the literature and challenges with modeling adaptation in IAMs with proposed conceptual framework by Karen Fisher-Vanden, Ian Sue Wing and others, and the other two papers showcase model adaptation in IAMs (AD-DICE, AD-WITCH) and investigate the mix and tradeoffs between mitigation and adaptation strategies. I also attach the Energy Economics special issue introduction Alex shared.

Thanks and looking forward to the discussion,
Jia

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Kime, Robin[Kime.Robin@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]
From: Bowen, Jennifer
Sent: Thur 7/9/2015 8:07:44 PM
Subject: RE: question from Robin K for website for SCC info

Thank you for the quick and informative reply!

From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 4:05 PM
To: Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Hi Jenny and Robin,

If you are looking for an EPA website on SCC, it is:
<http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> . However, I don't think this has been updated yet to reflect the recent revision, etc. Kate Shouse (ccd above) might be able to tell you when we are likely to update it.

However, the 7/2 OMB blog post (<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>) provides the most recent info and includes links to the current TSD and response to public comments received through the recent OMB comment solicitation.

Hope this helps.

Thanks,

Elizabeth

From: Bowen, Jennifer
Sent: Thursday, July 09, 2015 3:57 PM

To: Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: question from Robin K for website for SCC info

What is the best website to point folks to for more info re: SCC?

Thank you.

Jenny

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Shouse, Kate
Sent: Tue 7/7/2015 2:47:23 PM
Subject: RE: social cost of methane Q&As

No, sorry about that, I must have been searching an older version already opened on my computer. I double checked and don't see any. Thanks!

From: Kopits, Elizabeth
Sent: Tuesday, July 07, 2015 10:16 AM
To: Shouse, Kate
Subject: RE: social cost of methane Q&As

Really? I thought I updated to Academies. Did I miss one?

From: Shouse, Kate
Sent: Tuesday, July 07, 2015 9:47 AM
To: Kopits, Elizabeth
Subject: RE: social cost of methane Q&As

Thanks! I had the other updated comm sheets but inadvertently failed to save the methane desk statement to my hard drive.

The 7/1 version shows "NRC" rather than Academies. Do you think it's worthwhile to update that now or just save it for the release of landfills and o&g?

From: Kopits, Elizabeth
Sent: Tuesday, July 07, 2015 9:35 AM
To: Shouse, Kate; DeLuca, Isabel
Subject: RE: social cost of methane Q&As

Sorry! Correction: I meant to say comms not OCIR. I sent it to Tom Reynolds, Liz Purchia,

John Millett last Wednesday, along with other Q&A for the 7/2 SCC RTC release.

From: Kopits, Elizabeth
Sent: Tuesday, July 07, 2015 9:21 AM
To: Shouse, Kate; DeLuca, Isabel
Subject: RE: social cost of methane Q&As

Hi Isabel and Kate,

Please use this version instead. It reflects the use of the estimates in RIAs released to date (i.e., in HD2 sensitivity analysis only). This is the version I sent to OCIR late last week. Once landfills or O&G are released, we can provide you with an updated desk statement and Q&A.

Thanks!

Elizabeth

From: Shouse, Kate
Sent: Tuesday, July 07, 2015 9:15 AM
To: DeLuca, Isabel
Cc: Kopits, Elizabeth
Subject: RE: social cost of methane Q&As

Hi, Isabel. I've attached the latest desk statement on social cost of methane, which includes Q&As. I've copied Elizabeth Kopits to make sure she doesn't have any further updates. Elizabeth, I took the 6/15/15 draft and updated the NRC nomenclature and added the links to SCC TSD/Academies announcement (redline). If you have any further changes, please let us know.

Isabel, did OAQPS communications ask for these talking points or was it regulatory staff seeking

Q&As for internal purposes? I've had to reschedule the briefing but am talking to David Cozzie at noon.

Thanks!

Kate

From: DeLuca, Isabel
Sent: Monday, July 06, 2015 5:33 PM
To: Shouse, Kate
Subject: social cost of methane Q&As

Hi Kate,

I know you're briefing OAQPS on the social cost of methane tomorrow. They've asked whether or not we have any canned Q&As prepared on the topic yet. I'll have to dig to see what I have, but thought I'd also punt to you in case you have something handy that is in shape to share.

Thanks,
Isabel

Isabel DeLuca

Climate Change Division, US EPA

(202) 343-9247



Key Qualifications

Dr. Carney is a terrestrial ecologist with more than 20 years of experience in various aspects of environmental science, including global climate change analysis, terrestrial ecosystem ecology, and biodiversity conservation. She currently leads a wide range of analytical efforts at Abt Associates, many of which are focused on understanding, mitigating, and adapting to the impacts of climate change on ecosystems. Dr. Carney's recent work includes analyses of (1) the impacts of climate change on ecosystem services in the United States, (2) ways in which state authorities can enable or inhibit conservation actions in the face of climate change, (3) different U.S. climate policy options for reducing deforestation and emissions, and (4) the performance of forest management offset protocols developed for voluntary carbon markets. Dr. Carney has also conducted academic research related to carbon cycling in natural ecosystems, including a study that demonstrated that elevated atmospheric carbon dioxide causes soils to lose carbon over time by enhancing microbial degradation of soil organic matter. Dr. Carney holds a PhD in geological and environmental sciences from Stanford University and a BA in biology from Kalamazoo College.

Education

PhD, Stanford University,
Geological and Environmental
Sciences, 2003

BA, Kalamazoo College, Biology,
1993

Expertise/Skills

- Climate and global change
- Field and systems ecology
- Biodiversity conservation
- Program evaluation
- Forestry and terrestrial ecology
- Biogeochemistry
- Regulatory and applied environmental science

Key Projects and Responsibilities

Project Manager, Climate Impacts and Risk Assessment, U.S. Environmental Protection Agency Climate Change Division (CCD), Climate Science and Impacts Branch, Office of Air and Radiation (2015–present). Help coordinate and lead Abt efforts to develop and implement approaches for analyzing the impacts of climate change on the following key sectors/dynamics in the United States: coral reef cover, terrestrial ecosystem carbon storage, wildfire frequency and severity, recreational fishing, flooding damage, bridge degradation and replacement, water supply and demand, and human mortality associated with extreme heat.

Project Manager, Climate Change Impacts on Ecosystem Services, U.S. Environmental Protection Agency Climate Change Division (CCD), Climate Science and Impacts Branch, Office of Air and Radiation (2009–2012).

Assembled and led a multi-disciplinary team that is developing and implementing an approach for providing a first-order estimate of the impact of climate change on key ecosystem services in the United States. The results from this project have been used to highlight the benefits and risks of different climate mitigation policies. Key dynamics and related services of interest include coral reef degradation and loss, ecosystem carbon storage, wildfire dynamics, and changes in freshwater recreational fishing.



Lead Analyst, Forest Management Methodology Road Test and Updates (2012–2013)

Played a lead technical role in analyzing forest management methodologies from climate leaders and other entities to highlight differences among them. Specifically compared procedures and/or criteria for analyzing the eligibility, additionality, baselines, leakage, and monitoring of projects under each protocol, as well as the net carbon credits generated. Suggested revisions to various protocols.

Project Manager and Technical Lead, Identification of Ecosystem Thresholds, Phase I, U.S. Environmental Protection Agency Climate Science and Impacts Branch, Climate Change Division, Office of Air and Radiation (2008–2009).

Led a team that identified and described key ecosystem thresholds that can be scientifically linked to specific greenhouse gas concentrations, global or continental temperature or precipitation changes, or altered frequency or magnitude of disturbance events. Results may be used to help identify the benefits (i.e., avoided harm) associated with stabilizing greenhouse gas concentrations.

Selected Publications

Mills, D., R. Jones, K. Carney, A. St. Juliana, R. Ready, A. Crimmins, J. Martinich, K. Shouse, B. DeAngelo, and E. Monier. 2014. Quantifying and monetizing potential climate change policy impacts on terrestrial ecosystem carbon storage and wildfires in the United States. *Climatic Change*. April. Available: <http://link.springer.com/article/10.1007%2Fs10584-014-1118-z>.

Carney, K.M., B. Lazar, C. Rodgers, D.R. Lane, P.A.T. Higgins, R. Jones, S. Morlando, and A.E. Ebbets. 2013. Chapter 2: Recent and future climate change and potential implications for species and ecosystem dynamics. In *Conserving Wildlife Populations in a Changing Climate*, J. Brodie, E. Post, and D. Doak (eds.). University of Chicago Press.

Nelson, E., K. Carney, C. Fissore, N. Olwero, A. Plantinga, and B. Stanley. 2012. Chapter 3: Terrestrial carbon storage and sequestration. In *The Theory and Practice of Ecosystem Service Valuation*, P. Kareiva, T. Ricketts, G. Daily, H. Tallis, and S. Polasky (eds.). Oxford University Press.

Lane, D., K. Carney, and D. Chapman. 2009. Identifying, scaling, and evaluating groundwater restoration projects as compensation for groundwater injuries. *International Journal of Soil, Sediment and Water* 2(1):Article 3.

Zhang, W., T.H. Ricketts, C. Kremen, K.M. Carney, and S.M. Swinton. 2007. Ecosystem services and dis-services to agriculture. *Ecological Economics* 64:253–260.

Carney, K.M., B.A. Hungate, B.G. Drake, and J.P. Megonigal. 2007. Altered soil microbial community at elevated CO₂ leads to loss of soil carbon. *Proceedings of the National Academy of Sciences* 104(12):4990–4995.

Carney, K.M. and P.A. Matson. 2005. Plant communities, soil microorganisms, and soil carbon cycling: Does altering the world belowground matter to ecosystem functioning? *Ecosystems* 8:928–940.

Carney, K.M., P.A. Matson, and B.J.M. Bohannan. 2004. Diversity, composition, and function of tropical soil nitrifiers across a plant diversity gradient and among land use types. *Ecology Letters* 7:684–694.



Key Qualifications

Mr. Mills is an environmental economist with expertise evaluating human health and bio-physical impacts from climate-sensitive stressors, including extreme temperatures, air pollution, and wildfires. He has synthesized epidemiological and economic studies for qualitative reviews of these impacts, and developed and applied models that quantify and monetize these impacts for future climates and explore the sensitivity of the results to different factors. Mr. Mills also has extensive experience developing, evaluating, and scaling projects that compensate the public for natural resources injuries resulting from releases of hazardous substances, oil, or other sources of degradation. He has developed and applied habitat equivalency analyses (HEAs), resource equivalency analyses (REAs), and benefits-transfer approaches to summarize elements of natural resource injuries and the potential benefits of restoration projects. His work in these areas has been published in peer-reviewed journals and government reports.

Education

MA, University of Colorado,
Economics, 1997

BA, Colby College,
Economics, 1991

Expertise/Skills

- Environmental and resource economics
- Climate change vulnerability and impacts
- Policy analysis

Selected Project Experience

Special Report: Impacts of Climate Change on Human Health in the United States, U.S. Environmental Protection Agency (EPA; 2014–present). Participating as a contributing author for several chapters, including the Introduction, Extreme Temperatures, and Populations of Concern, for a special multi-agency report scheduled for release in 2016 that will provide a review of the literature and assessment of the potential health impacts of climate change in the United States.

Impact of Climate Change on Ecosystem Services, EPA (2011–present). Develop and apply methods to quantify and monetize the potential impacts of climate change on area burned and terrestrial ecosystem carbon storage in the United States by integrating the use of climate projections with dynamic global vegetation models and results from natural resource economics.

Impact of Climate Change on Vectorborne and Waterborne Disease, EPA (2011–present). Screen and select a subset of climate-sensitive vectorborne and waterborne diseases for review of available information and possible development of modeling techniques to quantify and monetize changes in future incidence attributable to climate change, while developing risk communication products including integrated map products.

Health and Welfare Impacts of Extreme Heat Events, EPA (2002–present). Multi-year project to synthesize, develop, and apply information on the health risks, impacts, and possible programmatic responses to extreme heat events in the United States. Past work included managing the development of the Excessive Heat Events Guidebook (EPA 430-B-06-005, June 2006). Current tasks include continuing to develop models with integrated research teams capable of quantifying future mortality attributable to temperature in future climates, focusing on changes in extremely hot and cold days as well as changing temperature distributions across seasons.



Benefits Assessment of Alternative Air Pollution Controls, EPA, Clean Air Markets Division (1998–2013)

Quantified and monetized the potential state, regional, and national health and welfare benefits of potential and actual changes in concentrations of airborne pollutants and visibility.

Vulnerability Assessment Framework Review, EPA (2010–2011)

Completed a white paper reviewing and summarizing vulnerability assessment frameworks to support discussions at the January 2011 Vulnerability Assessment Workshop held by the National Climate Assessment Program.

Selected Publications

- Mills, D., J. Schwartz, M. Lee, M. Sarofim, R. Jones, M. Lawson, M. Duckworth, and L. Deck. 2014. "Climate Change Impacts on Extreme Temperature Mortality Select Metropolitan Areas in the United States." *Climatic Change*. June. Available: <http://link.springer.com/article/10.1007/s10584-014-1154-8>
- Mills, D., R. Jones, K. Carney, A. St. Juliana, R. Ready, A. Crimmins, J. Martinich, K. Shouse, B. DeAngelo, and E. Monier. 2014. "Quantifying and Monetizing Potential Climate Change Policy Impacts on Terrestrial Ecosystem Carbon Storage and Wildfires in the United States." *Climatic Change*. April. Available: <http://link.springer.com/article/10.1007/s10584-014-1118-z>
- Ebi, K.L. and D. Mills. 2013. "Winter Mortality in a Warming Climate: A Reassessment." *Climate Change* 4(3):203–212.
- Kalkstein, L.S., S. Greene, D.M. Mills, and J. Samenow. 2011. "An Evaluation of the Progress in Reducing Heat-related Human Mortality in Major U.S. Cities." *Natural Hazards* 56:113–129.
- Mills, D.M. 2009. "Climate Change, Extreme Weather Events, and U.S. Health Impacts: What Can We Say?" *Journal of Environmental and Occupational Medicine* 51(1):26–32.
- Ebi, K.L., J. Balbus, P.L. Kinney, E. Lipp, D. Mills, M.S. O'Neill, and M. Wilson. 2008: "Effects of Global Change on Human Health." In *Analyses of the Effects of Global Change on Human Health and Welfare and Human Systems*. A report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. [J.L. Gamble (ed.), K.L. Ebi, F.G. Sussman, and T.J. Wilbanks (Authors)]. U.S. Environmental Protection Agency, Washington, DC, pp. 2-1–2-78.
- Ebi, K.L., D.M. Mills, J.B. Smith, and A. Grambsch. 2006. "Climate Change and Human Health Impacts in the United States: An Update on the Results of the U.S. National Assessment." *Environmental Health Perspectives* 114(9):1318–1324.
- Chestnut, L.G. and D.M. Mills. 2005. "A Fresh Look at the Benefits and Costs of the US Acid Rain Program." *Journal of Environmental Management* 77(3):252–266.



Key Qualifications

Dr. Wobus is an earth scientist with specific expertise in geomorphology, surface and groundwater hydrology, and numerical modeling. His recent research has focused on climate change impacts on landscapes and human systems. This research has included a study of the erosion of permafrost-dominated coastal bluffs in the Arctic driven by warming seas and longer ice-free seasons; analysis of long-term climate change and the morphology of river systems in the Rockies and central United States; analysis of long-term meteorological records to characterize historical and potential future extremes in precipitation and temperature; and development of a numerical modeling framework to estimate the effects of different climate change scenarios on coral reefs.

Education

PhD, Massachusetts Institute of Technology, Earth Sciences (Geomorphology), 2005

MS, Dartmouth College, Earth Sciences (Hydrogeology), 1997

AB, Bowdoin College, Economics and Geology, *summa cum laude*, 1995

Expertise/Skills

- List bullets that correspond to your proposed position as they relate to the SOW
- Environmental data analysis
- Numerical modeling
- Fluvial geomorphology
- Surface and groundwater hydrology
- Geographic information systems (GIS)

Prior to joining Abt Associates, Dr. Wobus was a research scientist and research assistant at the University of Colorado and the Massachusetts Institute of Technology, respectively. In these roles, his research focused primarily on numerical modeling of fluvial erosion, at scales ranging from individual cross sections to mountain ranges. His peer-reviewed publications have appeared in journals including *Nature*, *Geophysical Research Letters*, *Climatic Change*, *Earth and Planetary Science Letters*, and the *Journal of Geophysical Research*.

Selected Projects

Technical lead, Modeling effects of climate change on extreme events in the United States (ongoing). For the U.S. Environmental Protection Agency (EPA), Dr. Wobus has assisted with the development of the climate database that underlies the Climate Resilience Evaluation and Awareness Tool (CREAT) for water utilities. Dr. Wobus' role in this project has been to process and analyze historical meteorological data from climate stations across the United States, and to develop algorithms to generate specific future scenarios from a full suite of climate model outputs. The major components of this work have included (1) fitting generalized extreme value distributions to historical precipitation data to estimate the magnitude of extreme precipitation events with specified recurrence intervals; (2) analysis of climate model outputs to characterize the distribution of future changes to average and extreme conditions; (3) Analysis of historical temperature data to characterize extreme (95th percentile) heat events by station and by region; and (4) superposition of projected changes from global climate models onto historical average and extreme temperature conditions to develop future climate scenarios for water utility planning.



Project manager and technical lead, Climate change, mineral development and salmon habitat quality in southwestern Alaska (ongoing)

For The Nature Conservancy, Dr. Wobus has led a series of projects to evaluate how climate change and mineral development might alter salmon habitat quality in southwestern Alaska. This work has included characterization of hydrologic and geochemical baseline conditions in watersheds that would be impacted by a proposed gold-copper mine; assistance with development of an integrated hydrologic model of the watershed to estimate hydrologic and geochemical alterations from mining; and extension of this model to project changes in salmon habitat quality and thermal suitability resulting from climate change.

Technical lead, Modeling the effects of short-lived climate forcers (SLCFs) on Arctic climate, EPA, Climate Change Division (ongoing)

For this project, Dr. Wobus has assisted with modeling and data analysis to estimate the relative contributions to Arctic climate change from SLCFs emitted from different regions, sectors, and latitudes. Ongoing work is focused on coupling these model results with future emissions scenarios, to quantify the Arctic temperature reductions that might be realized from different policy decisions.

Principal investigator and technical lead, Climate change impacts on Arctic coastal erosion, Office of Naval Research (2008–2011)

For the Office of Naval Research, Dr. Wobus was the lead principal investigator on a multi-institution, field-based study of coastal erosion along a permafrost coastline in northern Alaska. This project included coordination of field activities along the Beaufort Sea coast; installing instrumentation and time-lapse cameras to monitor changes in coastal position and permafrost temperatures; and developing models describing the physical processes responsible for rapid coastline change. A time-lapse video from this project was featured in the New York Times in 2008.

Selected Publications

- Barnhart, K.R., R.S. Anderson, I. Overeem, C. Wobus, G.D. Clow, and F.E. Urban. 2014. Modeling erosion of ice-rich permafrost bluffs along the Alaskan Beaufort Sea coast. *Journal of Geophysical Research – Earth Surface*. doi: 10.1002/2013JF002845.
- Lane, D., R. Jones, D. Mills, C. Wobus, R.C. Ready, R.W. Buddemeier, E. English, J. Martinich, K. Shouse, and H. Hosterman. 2014. Climate change impacts on freshwater fish, coral reefs, and related ecosystem services in the United States. *Climatic Change*. doi: 10.1007/s10584-014-1107-2.
- Wobus, C., M. Lawson, R. Jones, J. Smith, and J. Martinich. 2013. Estimating monetary damages from flooding in the United States under a changing climate. *Journal of Flood Risk Management*. doi: 10.1111/jfr3.12043.
- Overeem, I., R.S. Anderson, C.W. Wobus, G.D. Clow, F.E. Urban, and N. Matell. 2011. Sea ice loss enhances wave action at the Arctic coast. *Geophysical Research Letters* 38, L17503. doi:10.1029/2011GL048681.
- Matell, N., R.S. Anderson, I. Overeem, C. Wobus, F.E. Urban, and G.D. Clow. 2011. Modeling the subsurface thermal impact of Arctic thaw lakes in a warming climate. *Computers and Geosciences*. doi:10.1016/j.cageo.2011.08.028.



- Wobus, C.W., R.S. Anderson, I. Overeem, F. Urban, and G.D. Clow. 2011. Thermal erosion of a permafrost coastline: Improving process-based models using time-lapse photography. *Arctic, Antarctic and Alpine Research* 43(3):474–484.
- Wobus, C.W., G.E. Tucker, and R.S. Anderson. 2010. Does climate change create distinctive patterns of landscape incision? *Journal of Geophysical Research – Earth Surface* 115. doi: 10.1029/2009JF001562.
- Wobus, C.W., G.E. Tucker, and R.S. Anderson. 2006. Self-formed bedrock channels. *Geophysical Research Letters* 33(L18408). doi: 10.1029/2006GL027182.
- Wobus, C.W., A.M. Heimsath, K.X. Whipple, and K.V. Hodges. 2005. Active out-of-sequence thrust faulting in the central Nepalese Himalaya. *Nature* 434:1008–1011.



Key Qualifications

Mr. Jones has conducted geographic information systems (GIS) and remote sensing analysis for numerous clients. He has extensive experience providing GIS and remote sensing support for natural resource damage assessments and providing litigation support, including preparation of exhibits used in court. Mr. Jones has also conducted extensive work on climate change, estimating the impacts and adaptation options to the built and natural environments and incorporating physical impacts with economic data to estimate costs.

Education

MA, University of California,
Davis, Geography, 1993

BA, University of Colorado,
Boulder, Geography, 1989

BA, Regis University,
Philosophy (geology minor),
1987, *Summa Cum Laude*

Expertise/Skills

- GIS
- Remote sensing analysis
(including satellite imagery
and aerial photo
interpretation)
- Cartographic design
- Spatial modeling of climate
change impacts
- Geomorphology

Projects in this area include producing climate change projections for average and extreme temperature and precipitation changes and sea level rise used for the U.S. Environmental Protection Agency's (EPA's) Climate Resilience Evaluation & Awareness Tool (CREAT); modeling climate change impacts on snow quantity/quality for Park City, Utah, and Mt. Bachelor, Oregon, and additional runoff analysis in Aspen, Colorado; modeling the ecological consequences of human responses to sea level rise; modeling populations affected from sea level rise and tropical cyclone storm surge in major cities in Asia; quality control of coastal elevation data and summarization of areas vulnerable to inundation from sea level rise in the U.S. mid-Atlantic states; preparation support of EPA's U.S. Climate Change Science Program Synthesis Assessment Product 4.1, *Coastal Sensitivity of Sea Level Rise: A Focus on the Mid-Atlantic Region* and associated background documents; examination of the effects of climate change and urbanization to vegetation communities in California; quantification of stationary point sources, mobile sources, and land use-induced sources (derived from classification of plant communities using Landsat TM imagery) of air pollutants for incorporation into regional air quality models; modeling the vulnerability of water resources in watersheds across the United States to global climate change; modeling the potential impact of increased stream temperatures from climate change on recreational fisheries across the United States; and modeling shore bird habitat loss from sea level rise due to global climate change. Lastly, Mr. Jones has extensive experience generating Federal Geographic Data Committee (FGDC) compliant metadata for federal and non-federal clients.

Select Project Descriptions

Incorporating Climate Change Data and Scenarios into EPA's Climate Resilience Evaluation & Awareness Tool

Abt Associates enhanced EPA's Climate Resilience Evaluation & Awareness Tool (CREAT). Version 1.0 of the CREAT tool allowed water utility personnel to evaluate the potential impacts of climate change on their utility using traditional risk assessment and a scenario-based decision making framework, but only by using qualitative information on climate change. We enhanced the functionality of CREAT v2.0 by adding spatially explicit, quantitative climate change



projections across the entire U.S. land area. We used a subset of nine CMIP3 models that had sufficient information available to calculate changes in temperature, precipitation, 24-hour precipitation event magnitudes and return intervals, and sea level rise projections along the coast and tidally influenced rivers. These data were downscaled using bias-correction and spatial downscaling techniques, and additional statistical analysis of model outputs was performed to define a “warm and wet,” a “hot and dry,” and a “median” model. These three models were used to provide three scenarios encompassing a range of physically realistic potential climate changes for use by utility personnel. Abt worked with East Bay Municipal Utility District and the Wilmington, Delaware, Department of Public Works to test and refine the available climate data and the tool interface. We are currently enhancing the functionality of CREAT v2.0 for CREAT 3.0 using the latest climate projection data (CMIP5) referenced in IPCC’s latest assessment report (AR5) and using sea level rise estimates from the U.S. National Climate Assessment.

Sea Level Rise Response Strategies

In an effort to identify the impacts of sea level rise along the U.S. Atlantic Coast, EPA conducted a series of evaluations of likely state and county planning strategies. In this study, Stratus Consulting conducted a pilot assessment of the ecological consequences of sea level rise response strategies, working with local experts to develop a habitat classification scheme and GIS mapping rules to delineate habitats and biological resources at risk under alternative planning scenarios and to help prioritize areas for environmental protection.

Modeling Change in Terrestrial Ecosystem Carbon Storage and Wildfire

Stratus Consulting supported EPA in estimating changes in vegetation and the amount of terrestrial ecosystem carbon storage, acreage burned by wildfires, and the grazing potential for rangelands under alternative greenhouse gas emission scenarios using the MC-1 dynamic global vegetation model. Output from the vegetation, carbon, and fire modeling served as input into economic models to estimate the change in value of ecosystem services from alternative emission policies.

Climate Change Impacts on Freshwater Recreational Fishing in the United States

Stratus Consulting developed a GIS for estimating the effects of climate change on U.S. freshwater fish assemblages in the lower 48 states. The GIS model combined spatial climate data with flow and temperature algorithms to quantify changes in the amount of thermally suitable habitat by fish guild (cool, warm, and rough) under various climate change scenarios. Based on the predicted shifts in fish assemblages, we then estimated the potential economic impacts associated with recreational fishing. This work was published in the journal *Mitigation and Adaptation Strategies for Global Change*.

Selected Publications

Mills, D., J. Schwartz, M. Lee, M. Sarofim, R. Jones, M. Lawson, M. Duckworth, and L. Deck. 2014. Climate change impacts on extreme temperature mortality in select metropolitan areas in the United States. *Climatic Change*. June. Available: <http://link.springer.com/article/10.1007/s10584-014-1154-8>.

Henderson, J., C. Rodgers, R. Jones, J. Smith, K. Strzepek, and J. Martinich. 2013. Economic impacts of climate change on water resources in the coterminous United States. *Mitigation*



and Adaptation Strategies for Global Change. doi: 0.1007/s11027-013-9483-x. Available: <http://link.springer.com/content/pdf/10.1007%2Fs11027-013-9483-x.pdf>

- Wobus, C., M. Lawson, R. Jones, J. Smith, and J. Martinich. 2013. Estimating monetary damages from flooding in the United States under a changing climate. *Journal of Flood Risk Management*. doi: 10.1111/jfr3.12043.
- Jones, R.W., C. Travers, C. Rodgers, B. Lazar, E. English, J. Lipton, J. Vogel, K. Strzepek, and J. Martinich. 2013. Climate change impacts on freshwater recreational fishing in the United States. *Mitigation and Adaptation Strategies for Global Change* 18(6):731–758. doi: 10.1007/s11027-012-9385-3. Available: <http://link.springer.com/article/10.1007%2Fs11027-012-9385-3>.
- Wright, L., P. Chinowsky, K. Strzepek, R. Jones, R. Streeter, J.B. Smith, J.-M. Mayotte, A. Powell, L. Jantarasami, and W. Perkins. 2012. Vulnerability of United States bridges to potential increases in flooding from climate change. *Mitigation and Adaptation Strategies for Global Change*. doi: 10.1007/S11027-011-9354-2.
- Jones, R. and L. Strange. 2009. An analytical tool for evaluating the impacts of sea level rise response strategies. *Management of Environmental Quality* 20(4)383–407.
- Titus, J.G., R. Jones, and R. Streeter. 2008. Maps depicting site-specific scenarios for wetlands accretion as sea level rises in the Mid-Atlantic region. Section 2.2 in *Background Documents Supporting Climate Change Science Program Synthesis and Assessment Product 4.1: Coastal Elevations and Sensitivity to Sea Level Rise*, J.G. Titus and E.M. Strange (eds.). EPA 430R07004. U.S. Environmental Protection Agency, Washington, DC.



Key Qualifications

Mr. Donahue has experience providing environmental policy research and analysis support for a range of U.S. government, foundation, and nongovernmental programs and agencies, primarily focusing on climate change mitigation and adaptation.

Education

MPP, Georgetown University, McCourt School of Public Policy, Environmental and Regulatory Policy, 2011

BA, Georgetown University, Government, 2006

Expertise/Skills

- Environmental policy research, analysis, and implementation
- Climate change mitigation and adaptation
- Stratospheric protection
- Short-lived climate pollutant impacts and mitigation
- Capacity building in developing countries
- Communications and outreach
- Supporting voluntary programs
- Solid waste management assessment
- Environmental program evaluation
- State and local government policy tracking
- Best practices identification

His work is currently focused on evaluating and communicating about the effects of emissions of short-lived climate pollutants (SLCPs), including black carbon, methane, and hydrofluorocarbons (HFCs), as well as their associated mitigation strategies. Mr. Donahue supports the U.S. Environmental Protection Agency (EPA) Climate Change Division (CCD) in its efforts to reduce the impacts of SLCPs globally. This involves supporting EPA in its role in the Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants (CCAC). In addition, Mr. Donahue manages Abt Associates' support of the EPA GreenChill Partnership, a voluntary program that works with U.S. supermarkets to reduce their impacts on climate and the ozone layer. This support involves a wide range of communications, marketing, and outreach activities that use a variety of communications techniques and media. Mr. Donahue also has experience conducting research and analysis of financing strategies for climate adaptation projects, and has been supporting the United States Agency for International Development (USAID) in its efforts to train stakeholders in developing countries on strategies for securing funding for these projects.

Professional Experience

SLCP Emissions Mitigation Analysis and Communications

Black carbon and methane

- Mr. Donahue supports EPA in its role as a lead implementer of the CCAC Municipal Solid Waste (MSW) Initiative. His work involves providing research and technical analysis of MSW policies and practices in developing countries (primarily in Dhaka, Bangladesh, and Addis Ababa, Ethiopia; but also in Accra, Ghana; Jakarta, Indonesia; Amman, Jordan; Lima, Peru; Pune, India; and Rio de Janeiro, Brazil). This support typically involves in-country scoping studies, work plan development, and project planning and implementation. He also coordinates the development of communications materials and tools related to SLCP emissions and emissions reductions from the MSW sector. For example, he is developing a tool for estimating SLCP emissions from various solid waste management practices.
- For EPA, Mr. Donahue recently conducted an evaluation of several existing lifecycle analysis tools that help estimate greenhouse gas (GHG) emissions from the waste sector and



an analysis of the potential advantages and disadvantages of adapting these tools to estimate all SLCP emissions. The evaluation also explored issues to consider when developing a framework for collecting data to facilitate the quantification of SLCP emissions from the waste sector at the city level. Mr. Donahue presented the findings of the evaluation at a workshop hosted by ISWA and the United Nations Environment Programme (UNEP) in Paris in September 2013. This workshop brought together experts and practitioners to discuss opportunities and barriers to quantifying emissions of SLCPs (primarily methane and black carbon) from the MSW sector.

- Mr. Donahue assisted in the development of a synthesis document on the science of black carbon emissions and their impacts. In addition, he assisted in providing wide-ranging support for the development of EPA's *Report to Congress on Black Carbon*, including technical research and synthesis, graphics production, and editing services.
- Mr. Donahue assisted in an assessment of opportunities for reducing black carbon emissions from brick kilns, transportation fleets, and residential fuel use in South Asia. This involved extensive research into mitigation barriers, implementation initiatives, and the cobenefits that can be achieved while reducing emissions.
- Mr. Donahue assisted in developing a report for the Arctic Council Task Force on short-lived climate forcers. The report focused on mitigating the impacts of black carbon and methane emissions in the Arctic and included a technical supporting document and a recommendations summary for policymakers.

Hydrofluorocarbons

- Since 2008, Mr. Donahue has provided communications and marketing support for the EPA GreenChill program. One of the goals of this program is to assist the supermarket industry in transitioning away from high global warming potential (GWP) HFCs. His efforts have involved coordinating the development of communications and outreach materials for the partnership (including fact sheets, graphics, and guidance materials), managing the program's presence on social media, and coordinating a monthly webinar series focused on advanced refrigeration technologies and refrigerants.

Climate Change Vulnerability, Resilience, and Adaptation

- Mr. Donahue helped the USAID's Climate Resilient Infrastructure Services program in planning and facilitating a workshop for local stakeholders in Nacala-Porto, Mozambique. Mr. Donahue was part of a team of technical experts that led the four-day workshop that focused on building local capacity to access financing for climate adaptation projects. As part of the workshop, Mr. Donahue provided trainings on several topics, including (1) understanding the landscape of financing opportunities for adaptation projects, (2) developing project "theories of change" for project proposals, and (3) developing and presenting project proposal budgets.
- Mr. Donahue helped facilitate two, week-long workshops in Nairobi, Kenya. The workshops were hosted by the USAID Climate Change Resilient Development program. The purpose of these workshops was to assist stakeholders in planning and writing proposals for small grants to help scale-up climate services to smallholder farmers. These workshops built on the



Joseph D.B. Donahue, MPP

Senior Policy Analyst

discussions of a previous workshop that occurred in Senegal, in December 2012. The first week focused on cross-regional (Africa and South Asia) approaches, and the second week focused on Eastern and Southern Africa. Mr. Donahue was responsible for training workshop attendees about grant proposal writing.

- Mr. Donahue is a contributing author to the Intergovernmental Panel on Climate Change's Fifth Assessment Report. He contributed research on financing for adaptation for the Working Group II portion of the report.
- Mr. Donahue is assisting the USAID Climate Change Resilient Development program in developing a series of guidance documents on improving resilience to climate change in developing countries, including guidance documents focused on the water sector, coastal resources, and governance.



Key Qualifications

Mr. Chapman has over 28 years of experience in natural resource valuation and policy analysis, specializing in behavioral and welfare effects of environmental and natural resource impacts and federal and state environmental policy. He is experienced in the technical development and implementation of nonmarket valuation studies to measure the welfare effects of environmental contamination. In addition, Mr. Chapman has coordinated the development and evaluation of federal and state environmental policies and assisted in the development of federal regulations. He has over 10 years of experience working in the federal government conducting natural resource damage assessments (NRDAs), policy evaluation, and regulation development.

At Abt Associates, Mr. Chapman leads NRDA projects for state, federal, and tribal clients; is leading projects on nonmarket valuation studies including the valuation of groundwater, freshwater river systems, coral reefs, right whales, tribal resources, and improved weather information; and has worked on the conceptual and empirical estimates of the value of water for the American Water Works Research Foundation.

Education

MS, University of California, Berkeley, Natural Resource Economics, 1985

BA, University of California, Irvine, Economics, 1983

Expertise/Skills

- Environmental and resource economics
- Nonmarket valuation
- Survey research
- Natural resource damage assessment
- Benefit-cost analysis
- Policy analysis
- Program evaluation
- Tribal resource assessment

Selected Projects in Environmental Economics and Natural Resource Damage Assessments

Review of Federal Estimate of Social Cost of Carbon, State of Minnesota Department of Commerce and Pollution Control Agency. Led project on a detailed evaluation of the federal interagency workgroup's estimates of the social cost of carbon, and appropriateness of use by the State of Minnesota Public Utility Commission.

Extreme Temperature Impacts on Labor Supply, U.S. Environmental Protection Agency Climate Change Division (CCD), Climate Science and Impacts Branch, Office of Air and Radiation. Led Stratus Consulting efforts to develop and implement approaches and analysis to estimate impacts of extreme temperature on supply of labor in exposed industries.

Natural Resource Damage Assessment, Deepwater Horizon Oil Spill, Gulf of Mexico, National Oceanic and Atmospheric Administration, U.S. Department of Justice, and Louisiana Oil Spill Coordinator's Office. Overall project lead and project manager for human use assessment tasks, including coordination of initial onsite human use response coordination, and recreation and total value studies.



Valuation of Ecosystem Services from Elwha River Dam Removal and Floodplain Restoration, National Oceanic and Atmospheric Administration

Principal investigator (PI) and project team lead on a stated preference study to understand people's preferences for and value of ecosystem services (metrics) and the value the public places on these types of ecosystem services associated with the river dam removal and habitat restoration.

Natural Resource Damage Assessment, Kalamazoo River Oil Spill, Michigan, State of Michigan

Overall project lead and project manager for human use assessment tasks, including coordination of onsite human use (recreational fishing) survey design and implementation.

Value of Water and Role of Water Values in Water Supply Management, Awwa Research Foundation (AwwaRF)

Project examined the value of water in its many applications (including instream and extractive uses). This research describes a range of value concepts and measures that apply to water resources and water service provision, demonstrates how to estimate the value of water, and how it can be incorporated into the planning and management functions of water utilities and other water resource management agencies. Project explored a broad range of water uses and settings, including (1) conjunctive use values using reclaimed water; (2) commercial, industrial, and institutional (CII) values for reuse water applied to industrial proposes; (3) instream uses for ecological purposes, hydropower generation, and recreation; and (4) extractive use values for agricultural, industrial, and municipal (residential) users. Cases were developed to help illustrate relevant concepts, valuation methods, and the practical application of empirical findings to relevant water management issues.

Valuation of Protection and Restoration of Hawaiian Coral Reefs, National Oceanic and Atmospheric Administration

PI and project team lead on a nationwide stated preference study to value the public's preferences for and value of protecting and restoring coral reefs in Hawaii. Led to the first national study on the total value of protecting Hawaiian reefs.

Selected Publications

- Hosterman, H., J. Smith, and D. Chapman. 2015. Evaluating climate change adaptation for the Maldives' tourism industry. *Climatic Change* (under review).
- Chapman, D., R. Bishop, M. Hanemann, B. Kanninen, J. Krosnick, E. Morey, and R. Tourangeau. 2015. Scope test adequacy and adding up: Comments on Desvousges, Mathews, and Train. *Ecological Economics* (under review).
- Lipton, J., E. Ozdemiroglu, and D.J. Chapman (eds.). *Equivalency Methods for Environmental Liability in the European Union: Assessing Damage and Compensation under the Environmental Liability Directive*. Springer, V, 320 p. ISBN 978-90-481-9811-5 (forthcoming).
- Raucher, R.S., J. Clements, C. Donovan, D. Chapman, R. Bishop, G. Johns, M. Hanemann, S. Rodkin, and J. Garrett. 2013. The Value of Water Supply Reliability in the Residential Sector. WateReuse Research Foundation Report 08-09-1, Alexandria, VA.



- Hosterman, H., M. Lawson, C. Donovan, D. Chapman, and R. Bishop. 2013. Valuing ecosystem services using stated preference methods: Challenges and practical solutions. *AERE Newsletter* 33(1):21–30.
- Bishop, R.C., D.J. Chapman, B.J., Kanninen, and J.A. Krosnick. 2011. Total Economic Value for Protecting and Restoring Hawaiian Coral Reef Ecosystems. Final Report. Prepared for U.S. Department of Commerce National Oceanic and Atmospheric Administration, National Ocean Service, Office of National Marine Sanctuaries, and Office of Response and Restoration, Silver Spring, MD.
- Chapman, D.J., R.C. Bishop, W.M. Hanemann, B.J. Kanninen, J.A. Krosnick, E.R. Morey, and R. Tourangeau. 2009. Natural Resource Damages Associated with Aesthetic and Ecosystem Injuries to Oklahoma's Illinois River System and Tenkiller Lake. Expert Report for the State of Oklahoma. Case No. 05-CV-0329-GKF-SAJ. State of Oklahoma v. Tyson Foods, et al. In the United States District Court for the Northern District of Oklahoma. Volume I.
- Lane, D., K. Carney, and D. Chapman. 2009. Identifying, scaling, and evaluating groundwater restoration projects as compensation for groundwater injuries. *International Journal of Soil, Sediment and Water* 2(1):Article 3. Available: <http://scholarworks.umass.edu/intljssw/vol2/iss1/3>
- Adamowicz, V., D. Chapman, G. Mancini, W. Munns, G. Striling, and T. Tomasi. 2007. Valuation methods. In *Valuation of Ecological Resources: Integration of Ecological Risk Assessment and Socio-Economics to Support Environmental Decisions*, R.G. Stahl, L. Kapustka, W. Munns, and R. Bruins (eds.). SETAC Press, Pensacola, FL.
- Allen II, P.D., D.J. Chapman, and D. Lane. 2005. Scaling environmental restoration to offset injury using habitat equivalency analysis. Chapter 8 in *Economics and Ecological Risk Assessment, Applications to Watershed Management*, R.J.F. Bruins and M.T. Heberling (eds.). CRC Press, Boca Raton, FL, pp. 165–184.
- Chapman, D. and B. Julius. 2005. The use of preventative projects as compensatory restoration. *Journal of Coastal Research* SI(40):120–131.
- Chapman, D. and W.M. Hanemann. 2001. Environmental damages in court: The American Trader Case, A. Heyes (ed.). *The Law and Economics of the Environment* 319–367.



Key Qualifications

Mr. Smith has over 30 years of experience with environmental, policy, and regulatory issues, particularly as they relate to global climate change. He is an expert on global climate change impacts and adaptation. As the deputy director of the Climate Change Division (CCD), Mr. Smith worked with U.S. Environmental Protection Agency (EPA) Regions, states, and private industry to examine cost-effective greenhouse gas emissions reductions and adaptation to climate change. He was coeditor of EPA's Report to Congress, *The Potential Effects of Global Climate Change on the United States*, published in 1989; and *As Climate Changes: International Impacts and Implications*, published by Cambridge University Press in 1995, on international impacts of climate change. He has published seven edited books and more than 50 journal articles on climate change.

Education

MPP, University of Michigan,
Ann Arbor, Public Policy, 1982

BA, Williams College, Political
Science (International
Relations), 1979

Expertise/Skills

- Environmental policy analysis
- Climate change impacts and adaptation
- Economic analysis

Mr. Smith was a member of the U.S. National Assessment coordinating committee for the report to be published in 2014, a coordinating lead author for the North America chapter of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), a lead author for the Synthesis chapter on climate change impacts for the Fourth Assessment Report, and a coordinating lead author for the same chapter in the Third Assessment Report. (In 2007, the IPCC was awarded the Nobel Prize for Peace.) He has made numerous presentations on climate change to international and domestic audiences, including the United Nations Framework Convention on Climate Change and the American Society for Civil Engineers.

Selected Projects

Update of UNFCCC Vulnerability and Adaptation Handbook, United Nations Framework Convention on Climate Change Secretariat (2015–present). Mr. Smith is leading a team of international researchers to update the United Nations Framework Convention on Climate Change Handbook and training materials on vulnerability and adaptation (http://unfccc.int/national_reports/non-annex_i_natcom/training_material/methodological_documents/items/349.php). He is revising the guidance on vulnerability and adaptation frameworks, climate change scenarios, and integration of results including adaptation analysis. Under Mr. Smith's direction, Abt Associates staff are updating the guidance on monitoring, evaluation, and communications. The revised handbook and presentation materials will likely be published in the fall of 2015.



Additional Professional Experience

Support for the U.S. Environmental Protection Agency CREAT Tool, EPA Water Security Division through Computer Science Corporation (2011–present).

Mr. Smith is coordinating developing climate change data to be part of EPA's Climate Resilient Evaluation and Awareness Tool (CREAT). Abt is using the SimCLIM tool to provide estimates of change in average temperature, precipitation, and regional sea level rise. Abt is also using global climate model output to estimate change in extreme precipitation events. Mr. Smith is also coordinating the analysis of change in daily and sub-daily extreme precipitation events.

Economic Impacts of Climate Change on Egypt, United Nations Development Programme, Cairo (2010–2012)

Mr. Smith led a study estimating the potential economic impacts of climate change on Egypt. The study found the value of potential damages to be several percent of the Egyptian economy. The study was conducted in close collaboration with UNDP-Cairo staff and the Egyptian government. Mr. Smith used information from the Egyptian government on socioeconomic changes, climate change, and impacts as the basis for the study. He estimated changes in tourism and led a team of staff (Leland Deck) and consultants (Bruce McCarl and Paul Kirshen) estimating biophysical and monetary impacts on water resources, agriculture, and air quality. Mr. Smith remotely presented final results at a workshop in Cairo in April 2013. The study was published in the journal *Climate Research*.

Analysis of Use of Vulnerability Assessments by Water Utilities, Offices of Water and Research and Development, EPA (2009–2010)

Mr. Smith coordinated two studies for EPA examining how water utilities assess their vulnerability to climate change. One study summarized how more than two dozen utilities have assessed vulnerability, while the other examined four utilities in depth. The latter study assessed how information was used in particular for adaptations decisions.

Vulnerability of U.S. Bridges to Climate Change, EPA, Climate Change Division (2009–2010)

Mr. Smith coordinated a study of how U.S. bridges could be vulnerable to increased flooding from climate change. The study, done in collaboration with researchers from the University of Colorado and Massachusetts Institute of Technology, used GCM estimates of daily precipitation and estimated changes in peak 100-year and 2-year flow at the 8-digit HUC level. The National Bridge Inventory was used and bridges were divided into currently deficient and currently acceptable. Expert judgment was used to estimate how much of an increase in peak flow would make bridges vulnerable to climate change. The costs of strengthening vulnerable bridges was calculated.

Selected Publications

“Benefits of Greenhouse Gas Mitigation on the Supply, Management, and Use of Water Resources in the United States.” (Strzepek, K., J. Neumann, J. Smith, J. Martinich, B. Boehlert, M. Hejazi, J. Henderson, C. Wobus, R. Jones, K. Calvin, D. Johnson, E. Monier, J. Strzepek, and J.-H. Yoon). 2014. *Climatic Change*. doi: 10.1007/s10584-014-1279-9. Available: http://download.springer.com/static/pdf/14/art%253A10.1007%252Fs10584-014-1279-9.pdf?auth66=1418083078_14b01ba75111830699f947a759732ca2&ext=.pdf



- "Egypt's Economic Vulnerability to Climate Change." (Smith, J.B., B.A. McCarl, P. Kirshen, R. Jones, L. Deck, M. Abd Rabbo, M. Borhan, A. El-Ganzori, M. El-Shamy, M. Hassan, I. El-Shinnawy, M. Abrabou, M. Kotb Hassanein, M. El-Agizy, M. Bayoumi, and R. Hynninen). 2014. *Climate Research* 62:59–70. Available: <http://www.int-res.com/articles/cr2015/62/c062p059.pdf>
- "Climate Change Risks to US Infrastructure: Impacts on Roads, Bridges, Coastal Development, and Urban Drainage" (Neumann, J.E., J. Price, P. Chinowsky, L. Wright, L. Ludwig, R. Streeter, R. Jones, J. Smith, W. Perkins, L. Jantarasami, and J. Martinich). 2014. *Climatic Change*. doi: 10.1007/s10584-013-1037-4. Available: http://download.springer.com/static/pdf/770/art%253A10.1007%252Fs10584-013-1037-4.pdf?auth66=1405548945_9ef7f7b2114871a72064d1feb21b3e04&ext=.pdf
- "Estimating Monetary Damages from Flooding under a Changing Climate" (with C. Wobus, M. Lawson, R. Jones, and J. Martinich). 2013. *Journal of Flood Risk Management*. doi: 10.1111/jfr3.12043.
- "A Comprehensive Review of Climate Adaptation in the United States: More than Before, but Less than Needed" (with R. Bierbaum, A. Lee, M. Blair, L. Carter, F.S. Chapin III, P. Fleming, S. Ruffo, M. Stults, S. McNeeley, E. Wasley, and L. Verduzco). 2012. *Mitigation and Adaptation Strategies for Global Change*. DOI 10.1007/s11027-012-9423-1.
- Dangerous Climate Change: An Update of the IPCC Reasons for Concern* (J.B. Smith, S.H. Schneider, M. Oppenheimer, G.W. Yohe, W. Hare, M.D. Mastrandrea, A. Patwardhan, I. Burton, J. Corfee-Morlot, C.H.D. Magadza, H-M. Füssel, A. Barrie Pittock, A. Rahman, A. Suarez, and J-P. van Ypersele). 2009. *Proceedings of the National Academy of Sciences*. Available: <http://www.pnas.org/content/early/2009/02/25/0812355106>
- The Impact of Climate Change on Regional Systems: A Comprehensive Analysis of California* (J.B. Smith and R. Mendelsohn, eds.). 2006. Northampton, MA: Edward Elgar Publishing.
- "Estimating Global Impacts from Climate Change" (S. Hitz and J.B. Smith). 2004. *Global Environmental Change* 14(3):201–218.
- "A Synthesis of Potential Climate Change Impacts on the U.S." (J.B. Smith). 2004. Arlington, VA: The Pew Center on Global Climate Change.
- "U.S. Market Consequences of Global Climate Change" (D.W. Jorgenson, R.J. Goettle, B.H. Hurd, J.B. Smith, L.G. Chestnut, and D.M. Mills). 2004. Arlington, VA: The Pew Center on Global Climate Change.
- "Climatic Change and U.S. Water Resources: from Modeled Watershed Impacts to National Estimates" (B. Hurd, M. Callaway, J. Smith, and P. Kirshen). 2004. *Journal of the American Water Resources Association* 40(1):129–148.
- Climate Change, Adaptive Capacity and Development* (J.B. Smith, R.J.T. Klein, and S. Huq, eds.). 2003. London: Imperial College Press.
- "The Difficulties of Estimating Global Non-Market Damages from Climate Change" (J.B. Smith, J.K. Lazo, and B. Hurd). 2003. In *Global Climate Change: The Science, Economics and Politics* (J.M. Griffin, ed.). Northampton, MA: Edward Elgar. pp. 114–139.

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Bowen, Jennifer[Bowen.Jennifer@epa.gov]; Kime, Robin[Kime.Robin@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Shouse, Kate
Sent: Wed 7/15/2015 12:23:42 PM
Subject: RE: question from Robin K for website for SCC info

Hi, everyone. The updates to EPA's SCC website are now live – please see <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> and let me know if you have any questions (or see anything amiss). Thanks!

From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 4:05 PM
To: Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Hi Jenny and Robin,

If you are looking for an EPA website on SCC, it is:
<http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> . However, I don't think this has been updated yet to reflect the recent revision, etc. Kate Shouse (cc'd above) might be able to tell you when we are likely to update it.

However, the 7/2 OMB blog post (<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>) provides the most recent info and includes links to the current TSD and response to public comments received through the recent OMB comment solicitation.

Hope this helps.

Thanks,

Elizabeth

From: Bowen, Jennifer
Sent: Thursday, July 09, 2015 3:57 PM
To: Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: question from Robin K for website for SCC info

What is the best website to point folks to for more info re: SCC?

Thank you.

Jenny

This report is a response to a request from Katherine Kiel (Dec. 10, 2014) to review a draft EPA (no date) paper, "Valuing Methane Emission Changes in Regulatory Benefit-Cost Analysis." As part of the request I was provided with the 7 charge questions repeated below in italics, the EPA paper, and the paper: Alex L. Marten, Elizabeth A. Kopits, Charles W. Griffiths, Stephen C. Newbold, and Ann Wolverton, 2014 (on line) Incremental C₄H and N₂O mitigation benefits consistent with the US Government's SC-CO₂ Estimates, *Climate Policy*, which forms the basis for estimates provided in the draft EPA paper.

The basic objective of the EPA paper was to outline a process for establishing a social cost of methane (and possibly N₂O) that is consistent with the established basis for estimating a social cost of carbon previously developed by EPA.

1. *Has EPA correctly interpreted the SC-CH₄ estimates provided in Marten et al. (2014) as designed to measure the monetized value of the climate impacts from marginal changes in CH₄ emissions in a way that is appropriate for use in benefit-cost analysis of regulatory actions projected to change CH₄ emissions?*

The Marten et al. (2014) paper follows closely the original social cost of carbon approach developed by the EPA, using the same 3 IA models, expanding them to include methane and nitrous oxide. EPA's interpretation of the paper appears to be correct. The main addition was an explicit treatment of the lifetime of methane (and nitrous oxide). The formulation used is obviously a simplification of complex atmospheric chemistry but has been used in earlier publications and likely approximates a more complex representation. The *ad hoc* increase in radiative forcing to account for indirect effects is another simplification, and obviously has substantial impacts on the estimates. It is justified by the IPCC indirect estimates. It is not clear that the method includes the fact that abiogenic methane decays into CO₂ and hence may represent an additional impact of methane release. (Biogenic methane also decays into CO₂ but if that methane is derived from plant material that regrows it would then not represent an addition of CO₂ to the atmosphere.)

2. *Do you agree that the Marten et al. SC-CH₄ estimates are consistent with the USG SC-CO₂ estimates?*

While there is considerable controversy about how to estimate a Social Cost of Carbon from a theoretical standpoint as well as the empirical foundation for such an estimate, the method put forward by Marten et al. (2014) is theoretically and empirically consistent with the original Social Cost of Carbon estimates developed by EPA.

3. *Do you agree with EPA's characterization of the limitations of using the global warming potential (GWP) to approximate the SC-CH₄ (and other non-CO₂*

GHGs)?

I agree that using GWP's to scale the social cost of carbon would be theoretically inconsistent. As the EPA (no date) paper discusses, the Social Cost of Carbon method appropriately uses a discount rate to weight damages at different points in time, whereas the GWP approach stops at radiative forcing and then uses an arbitrary time horizon to truncate the effects, weighting effects in each year equally. This leads to the controversy about which GWP time horizon to use. Of course this controversy is not completely avoided as it resurfaces as a controversy about the appropriate discount rate. It appears to turn out that given the time path of damages the 100-year GWP of methane is very similar to the Social Cost of Methane relative to the Social Cost of Carbon as estimated in the Marten et al (2014) paper. (This was a conclusion Reilly and Richards (1993) reached.) With a very different path of damages this result may not hold. For that reason as EPA imagines updating these estimates, and for theoretical consistency, using the Marten et al. (2014) method for arriving at a Social Cost of methane (or nitrous oxide) appears much more defensible.

While it does not affect the basic conclusions, I have some issues with the paragraph in EPA (no date) repeated below in italics, especially the sentences highlighted here in bold.

*Furthermore, the assumptions made in estimating the GWP are not consistent with the assumptions underlying SC-CO₂ estimates in general, including the USG SC-CO₂ estimates. **For example the 100 year time horizon usually used in estimating the GWP is less than the 300 year horizon used in developing the USG SC-CO₂ estimates.** The GWP-approach also treats all impacts within the time horizon equally, independent of the time at which they occur. **This is inconsistent with the role of discounting in economic analysis, which accounts for a basic preference for earlier over later gains in utility, the small but positive probability of a large global catastrophe (e.g., large asteroid collision, super volcanic eruption, nuclear war), and expectations regarding future levels of economic growth.** In the case of CH₄, which has a relatively short lifetime compared to CO₂, the temporal independence of the **GWP could lead the approximation in (2) to underestimate the SC-CH₄ with a larger downward bias under higher discount rates (Marten and Newbold 2012).**¹*

Regarding the inconsistency of the 100- and 300-year horizons: Yes, I suppose this is true but there really is no direct comparison. In the economic analysis one hopefully has a far enough time horizon so that with discounting

¹ We note that the truncation of the time period in the GWP calculation could lead to an overestimate of SC-CH₄ for near term perturbation years in cases where the SC-CO₂ is based on a sufficiently low or steeply declining discount rate.

it is irrelevant. In some sense choice of discount rate is a substitute for the choice of time horizon—the higher the discount rate the shorter the time horizon. In a final version of this paper I might rephrase this as something like. *In the USG SC-CO₂ estimates a 300-year time horizon was used, long enough to minimize its effects on estimates given the discount rates used. In contrast the GWP approach is to truncate estimates at different time horizons (20-, 100-, 500-years), treating all impacts within the time horizon equally, independent of the time at which they occur.* I think this gets across the point you want to make without directly suggesting that the 100-year and 300-year horizons are inconsistent (when in fact that is not even comparable.)

Then the second emboldened sentence raising a huge set of issues and controversies. I think the sentence would be best deleted. The discount rate should not theoretically include the risk of catastrophe. Risks should be separately evaluated with a risk-free discount rate to arrive at an “expected” social cost of carbon, perhaps with a utility function that more heavily weights bad outcomes. While an observed rate of return can include a risk premium based on a specific assessment of the risk (and time profile of the risk) it is inappropriate to apply a risk premium to a discount rate and then apply that risk-adjusted rate to many different investment profiles. Here, different characterizations of when catastrophes may occur. Embedding risk into the discount rate in this manner is little different than using GWP’s with truncated time horizons to implicitly give different weights (1 or 0) to damages occurring at different times. And while in a Ramsey model the discount rate is approximately the sum of the pure rate of time preference plus the growth rate that again is calculation under certainty so using “expected growth” is inconsistent. Then you have the Weitzman argument that with uncertainty in the appropriate discount rate, one should use a declining rate. And bringing up things like asteroid collisions and such just seems distracting here.

Finally, I guess the last emboldened statement is true but it took me a long time to figure it out. A higher discount rate, as compared to a lower rate, will lead to a lower social cost of carbon (or methane). So concluding that it will underestimate the Social Cost of Methane seemed initially backward. Further a higher discount rate, while lowering the social cost of both gases, will tend to raise the Social Cost of Methane relative to that of carbon. But I guess if I fully parse this sentence, you are saying that taking a specific GWP-horizon (e.g 100 years) and deriving a SC of methane by applying it to your existing SC of carbon, then if you were to do this the right way with a high discount rate—that SC of methane would be higher than that derived using the shorthand method. Maybe there is a clearer way to say this...but then I’m not sure why this is important. There seems to be a concern about underestimating the methane value. You could just as easily say, that methane would be overvalued for low discount rates. I’d think you just want the CS of carbon and methane to be consistent and unbiased in either direction.

4. *Do you agree with EPA's assessment that direct estimates of the SC-CH₄, as developed by Marten et al., are more appropriate for monetizing changes in CH₄ emissions than using the GWP to scale the USG SC-CO₂?*

Yes, see above.

5. *Are there other existing approaches for monetizing the benefits (or dis-benefits) to society from reductions (increases) in CH₄ emissions that should be considered in regulatory analysis?*

Not of which I am aware. As the Reilly and Richards (1993) paper referred to in the Marten et al. (2014) paper the multiple impacts of these different gases, beyond climate change, could in principle be incorporated into the analysis but that raises further complications. E.g. CO₂ has some benefit to crop growth (disputed) but ozone (of which methane is a precursor) has not only climate implications but also damages to crops and health. However, with all the recognized limitations to the empirical foundation for the SC estimates, the chosen approach is theoretically sound.

6. *Although the focus of this review is on the application of estimates of the social cost of CH₄ to benefit-cost analysis for regulations, do your answers for the questions above hold for the application of the social cost of N₂O estimates provided in Marten et al.?*

Yes, the method is equally applicable to N₂O.

7. *Are there implementation issues not addressed in the paper that EPA should consider before applying the Marten et al. estimates in regulatory analysis?*

As the paper itself points out, the current approach of using a social cost of 0 is clearly not right and so whatever the limitations of existing methods its seems better to use something rather than nothing. Of course one could use a value that is so high that zero would be preferable, but I don't see that error here. More to the point: Accepting the Social Cost of Carbon estimates, this approach consistently applies the concept to methane (and potentially other GHGs).

John Reilly
MIT

Document Title: Valuing Methane Emission Changes in Regulatory Benefit-Cost Analysis

Approximate Length: 10 pages

Supporting Materials: Marten et al. (2014) (36 pages excluding Appendices)

Abstract and Charge Questions:

Consistent with Executive Order 12866, EPA conducts benefit-cost analysis to inform policy makers and the public about the potential economic implications of regulatory actions. EPA has promulgated regulations that result in changes in CH₄ emissions but has not yet quantified such impacts in its main benefit-cost analyses. Direct estimates of the benefits of mitigating CH₄ emissions have been presented in the scientific literature, but EPA has not used these estimates in benefit-cost analyses because they are inconsistent with U.S. Government (USG) estimates of the social cost of carbon dioxide (SC-CO₂).¹ A recently published paper (Marten et al. 2014) presents estimates of the social cost of CH₄ (SC-CH₄) that are consistent with USG estimates of the SC-CO₂. While it is anticipated that the USG will continue to improve the models and data it uses to estimate the SC-CO₂ in accordance with evolving scientific and economic understanding, the enclosed paper illustrates how EPA could apply the SC-CH₄ estimates from Marten et al. to improve upon the current treatment of methane impacts in regulatory impact analysis (RIA) so that they need not be implicitly assigned a value of zero in policy assessment. Consistent with EPA's peer review guidance, the Agency is seeking review of the application of these new benefit estimates to regulatory analysis before using them in an RIA. Specifically we seek guidance on the following questions:

1. Has EPA correctly interpreted the SC-CH₄ estimates provided in Marten et al. (2014) as designed to measure the monetized value of the climate impacts from marginal changes in CH₄ emissions in a way that is appropriate for use in benefit-cost analysis of regulatory actions projected to change CH₄ emissions?

I have read both Marten et al. (2014) and the review document and feel that the review document provides an accurate summary of the issues and methodologies discussed in Marten et al. (2014). I feel that Table 3 of the review document provides a nice example of how the SC-CH₄ estimates from Marten et al. (2014) could be used in BCAs of proposed regulations and underscores the bias that arises if a GWP-based approach is used rather than the direct approach proposed by Marten et al. (2014).

There, of course, is a whole host of issues that arise when applying any social cost measure to regulatory analyses, which have been extensively discussed in the literature

¹ See the February 2010 Technical Support Document (TSD) and November 2013 TSD Update for a complete discussion of the methods used to develop the USG SC-CO₂ estimates:
<http://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf>,
<http://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf>.

and which I expand on in my responses below. A key issue that I would like to raise here is that these measures are only appropriate for marginal changes in CH₄. These measures are not designed to be used to evaluate non-marginal changes in methane emissions (or any other gas, for that matter). Therefore, caution must be used when applying social cost measures like this.

2. Do you agree that the Marten et al. SC-CH₄ estimates are consistent with the USG SC-CO₂ estimates?

“Consistent” can have many interpretations. I will say that the Marten et al. SC-CH₄ estimates are computed in a similar way as the SC-CO₂ estimates, so in this regard, the two estimates are “consistent.” However, CO₂ is more explicitly modeled in the three models than CH₄ so in this regard they are not “consistent.” However, this inconsistency is due to limitations of the models and I feel that Marten et al. have taken appropriate steps to address these limitations the best way possible. However, gaps still remain and should be recognized.

3. Do you agree with EPA’s characterization of the limitations of using the global warming potential (GWP) to approximate the SC-CH₄ (and other non-CO₂ GHGs)?

The review document (and Marten et al) discusses a number of problems that arise when GWP is used to approximate SC-CH₄: (1) in the introduction and in section 2, the authors point out that the indirect effects of CH₄, as a precursor to tropospheric ozone and stratospheric water vapor, can amplify radiative forcing significantly (which would not be captured in the GWP); (2) GWP ignores important nonlinear relationships beyond radiative forcing in the chain between emissions and damages—e.g., increased agricultural productivity due to CO₂ fertilization would be incorrectly attributed to CH₄ if the GWP was used; (3) GWP does not account for differences in time horizons between gases—e.g., since CH₄ has a shorter lifetime than CO₂, the GWP approach would underestimate the SC-CH₄.

Although all three are technically correct, I feel that (1) and (2) could be addressed to a certain extent (although not perfectly) by adjusting the GWP to account for these biases. However, the temporal issue raised in (3) seems more difficult to address through simple adjustments to the GWP.

In sum, I agree with the authors that problems exist and that the direct approach in theory is the best way to avoid these issues.

4. Do you agree with EPA’s assessment that direct estimates of the SC-CH₄, as developed by Marten et al., are more appropriate for monetizing changes in CH₄ emissions than using the GWP to scale the USG SC-CO₂?

As discussed in my response to question 3 above, I agree that the direct approach is likely a superior approach to the indirect GWP approach. However, it should be noted that the direct approach has issues as well. Namely, as discussed in section 3, most models do not include an atmospheric stock-flow model of CH₄; thus, the authors were forced to develop a separate model to project the path of radiative forcing from a CH₄ perturbation, and then incorporate this path into the IAM exogenously. As a result, indirect or feedback effects are missed. For instance, climate change impacts on agriculture will affect methane emissions.

In sum, no approach is perfect but in my opinion, the “direct” approach used by Marten et al is preferred to the indirect GWP approach for the reasons outlined in the review document. However, the EPA should continue to seek improvements to the direct approach put forth by Marten et al.

5. Are there other existing approaches for monetizing the benefits (or dis-benefits) to society from reductions (increases) in CH₄ emissions that should be considered in regulatory analysis?

My complaint with past SC measures is the use of highly aggregated and stylized models to monetize the benefits of reductions. By using models that represent the global economy as one aggregate sector, we are missing important subsector interactions and distributional effects that can only be captured with a more disaggregated model, such as a computable general equilibrium model. My sense would be that these SC would be much higher if a more disaggregated model was used. Modeling the economy as one monolithic sector implies, for instance, perfect substitutability across subsectors which will underestimate the cost of damages. It also assumes perfect trade which can also underestimate the cost of damages. (See Chapter 6 of the IPCC WGIII Fifth Assessment Report which highlights some of these biases that arise with alternative model characteristics).

The use of these simplified models for SC estimates, I believe, is a large source of the criticisms we’ve seen with respect to the SCC reports. The use of more sophisticated economic models (like those used in the IPCC) is needed, in my opinion.

6. Although the focus of this review is on the application of estimates of the social cost of CH₄ to benefit-cost analysis for regulations, do your answers for the questions above hold for the application of the social cost of N₂O estimates provided in Marten et al.?

Yes.

7. Are there implementation issues not addressed in the paper that EPA should consider before applying the Marten et al. estimates in regulatory analysis?

I am not sure I would characterize these as “implementation” issues, but I do want to take this opportunity to stress the importance of being forthcoming with the shortcomings of these SC estimates. These shortcomings are not specific to any gas.

- (1) As discussed in my response to question 1, these estimates are not appropriate for evaluating large (non-marginal) changes in emissions of any of these gases.*
- (2) As discussed in my response to question 5, the SC values will be underestimated due to the use of highly aggregated models.*
- (3) These estimates do not take into account extreme or threshold events, which could amplify the estimates significantly.*
- (4) These estimates will be biased downward due to the omissions of nonmarket values and omitted impacts, and will be biased upward due to the lack of adaptation responses (although FUND does account for some of this).*

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: ees.jeem.0.2e6bae.ea460892@eesmail.elsevier.com
Sent: Tue 1/6/2015 5:27:33 AM
Subject: Reminder of Late Review for JEEM-D-14-00307

Ms. No.: JEEM-D-14-00307
Title: A SIMPLE FORMULA FOR THE SOCIAL COST OF CARBON
Corresponding Author: Prof. Matti Liski
Authors: Inge van den Bijgaart, ; Reyer Gerlagh,

Dear Ms. Kopits,

Thank you for having agreed to provide advice to the editors on the suitability of the above-mentioned manuscript for publication in Journal of Environmental Economics and Management. We note your review was due on Nov 09, 2014 but our records show it has not yet been received (58 days overdue). To enable Journal of Environmental Economics and Management to provide an efficient peer review service to authors, we would appreciate your input as soon as possible. Please let us know when we might expect your review.

Please submit your review online using the Elsevier Editorial System for Journal of Environmental Economics and Management (you may also retrieve the PDF from this website):

<http://ees.elsevier.com/jeem/>

If you need to retrieve password details, please go to: http://ees.elsevier.com/ynimg/automail_query.asp.

If you are unable to use the online system, please send your comments via email. If you believe that you have already returned your review, we have not received it and please ask that you resend it at this time. We do apologize for any inconvenience this may cause in advance.

Kind regards,

Mrs. Minu Thickitt
Journal Manager
Journal of Environmental Economics and Management

Journal of Environmental Economics and Management Editorial Office
E-mail: jeem@elsevier.com

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Cropper, Maureen
Sent: Tue 7/7/2015 1:04:08 PM
Subject: Who Performed the Computations for the SCC?

Elizabeth,

Who performed the actual computations for the SCC? Were they performed by EPA staff or someone else?

I hope all is well with you!

With best wishes,
Maureen

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Poehlman, Eric A
Sent: Thur 5/28/2015 10:51:51 PM
Subject: RE: The Social Cost of Carbon in Federal Rulemaking - Units - Metric ton vs ton

Hey there,

I stumbled across your presentation on the SCC here:

http://www.hks.harvard.edu/m-rcbg/cepr/Papers/2014/SCC_HKS%20Energy%20Policy%20Seminar_03%2031%2014_forweb.pdf

I noticed the values were listed as \$/ton and just thought it might be useful to clarify metric ton if this presentation is still in use.

Best,

Eric

Eric Poehlman

Associate Research Engineer

ENERGY & ENVIROMENT DIRECTORATE

Pacific Northwest National Laboratory
902 Battelle Boulevard
P.O. Box 999, MSIN K6-05
Richland, WA 99352 USA

Office: 509-371-7160

Mobile: 306-813-8521

eric.poehlman@pnnl.gov

To: Newbold, Steve[Newbold.Steve@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Marten, Alex
Sent: Thur 3/12/2015 2:03:14 PM
Subject: RE: NRC board comments on SCC

+ Elizabeth

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Marten, Alex
Sent: Thursday, March 12, 2015 10:03 AM
To: Newbold, Steve; Wolverton, Ann; Griffiths, Charles
Subject: NRC board comments on SCC

Hi All,

We received comments back from the NRC board on the draft charge questions that were presented last month. The attached includes a tracked changed version of the charge along with some of my initial reactions.

Do folks have time between 11am and 2pm today to discuss any initial reactions?

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

To: Beauvais, Joel[Beauvais.Joel@epa.gov]
Cc: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Kime, Robin[Kime.Robin@epa.gov]
From: McGartland, Al
Sent: Mon 1/5/2015 7:51:48 PM
Subject: Re: SCC - I will send you latest staff draft of charge within a couple of hours

I'm sure we agree a quick meeting would be very useful.

Sent from my iPhone

On Jan 5, 2015, at 2:04 PM, Beauvais, Joel <Beauvais.Joel@epa.gov> wrote:

Thanks, Elizabeth. I reviewed the draft you provided me before the holidays and have comments, but will hold those until I see the updated draft.

I would like to connect with you guys on process, as well as talk through a few elements of the charge to better understand the substance. I think it might make sense for us to get together tomorrow or Wednesday for a half hour if that would be possible. OK with you guys?

Joel

From: Kopits, Elizabeth
Sent: Monday, January 05, 2015 1:07 PM
To: Beauvais, Joel
Cc: McGartland, Al
Subject: SCC - I will send you latest staff draft of charge within a couple of hours

Hi Joel,

Happy New Year! I just talked with Al and he mentioned he talked to you about SCC. I am just in the process of incorporating some final (NCEE and CEB) staff level comments/edits on the draft charge, so I will send you the latest version within the next couple of hours.

Thanks,

Elizabeth

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Shouse, Kate
Sent: Mon 7/13/2015 4:26:47 PM
Subject: FYI: SCC memo is in the HD2 docket, which opened today

In case you want this reference in your files, the memo is at
<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2014-0827-0437>

From: Brunner, Christine
Sent: Monday, July 13, 2015 11:46 AM
To: HD GHG 2
Subject: HDGHG Docket items posted at Regulations.gov

<http://www.regulations.gov/#!searchResults:rpp=25;po=0;a=EPA;dktid=EPA-HQ-OAR-2014-0827>

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Cc: Evans, DavidA[Evans.DavidA@epa.gov]; Macpherson, Alex[Macpherson.Alex@epa.gov]
From: Shouse, Kate
Sent: Mon 6/1/2015 1:27:43 PM
Subject: RE: 111(d) RIA Ch 8: uncertainty and SCC

Thanks, Alex for the edits, and Elizabeth for the review. I think these look good and will add them to the Sharepoint version. Will also add a reference to Ch 4.

From: Kopits, Elizabeth
Sent: Monday, June 01, 2015 9:02 AM
To: Shouse, Kate; Marten, Alex
Cc: Evans, DavidA; Macpherson, Alex
Subject: RE: 111(d) RIA Ch 8: uncertainty and SCC

I think this is fine. My only recommendation is to also somewhere in this passage point the reader to Ch.4 for more discussion.

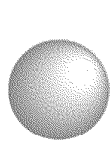
From: Shouse, Kate
Sent: Friday, May 29, 2015 1:29 PM
To: Marten, Alex; Kopits, Elizabeth
Cc: Evans, DavidA; Macpherson, Alex
Subject: 111(d) RIA Ch 8: uncertainty and SCC

Hi, everyone. Not sure when OP will have a chance to review the 111(d) RIA so wanted to flag a brief section that should be easy to review and does not hinge on any model runs. RIA Ch 8 includes several sections discussing uncertainty about analytical components, including the SCC. I don't recall why we included it in Ch 8 (Ch 4 already covers SCC) but we tried to minimize duplication.

In looking at the Ch 8 SCC and uncertainty discussion, I thought we might add a reference to the OMB RTC, which has a section on uncertainty. Please see the attached excerpt from 111(d) RIA

Ch 8 and let me know what you think.

Thanks,
Kate



RUBBER
manufacturers
association

1400 K Street, NW • Washington, DC 20005 • tel (202) 682-4800 • fax (202) 682-4854 • www.rma.org

February 26, 2014

Office of Information and Regulatory Affairs
Office of Management and Budget
Attn: Mabel Echols
NEOB, Room 10202
725 17th Street N.W.
Washington, D.C. 20503

Re: Technical Support Document: Technical Update of the Social Cost of Carbon for
Regulatory Impact Analysis Under Executive Order No. 12866;
Docket ID OMB-OMB-2013-0007

RMA is the national trade association representing major tire manufacturers that produce tires in the United States, including Bridgestone Americas, Inc., Continental Tire the Americas, LLC; Cooper Tire & Rubber Company; The Goodyear Tire & Rubber Company; Michelin North America, Inc.; Pirelli Tire North America; Toyo Tire Holdings of Americas Inc. and Yokohama Tire Corporation. RMA members thank the Office of Management and Budget (OMB) for your consideration of these comments on the social cost of carbon (SCC) estimates present in the Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866.¹

RMA members may be impacted by the SCC estimates because they manufacture tires and have an interest in future mobile source regulations developed by the National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) to set corporate average fuel economy standards and reduce CO₂, and also have an interest in future regulations developed by EPA to regulate CO₂ emissions and other greenhouse gas emissions from industrial facilities. Future Federal regulations that seek to reduce CO₂ emissions from mobile and stationary sources could be based on the SCC estimates. Due to the lack of transparency in deriving the SCC estimates RMA strongly recommends that the SCC estimates should not be used in rulemakings, and OMB should withdraw and revise the SCC estimates in an open and transparent process.

I. The SCC estimates were not derived in an open transparent process

In the *Center for Biological Diversity v. National Highway Traffic Safety Administration*², the court held that the final Average Fuel Economy Standards for Light Trucks,

¹ Interagency Working Group on Social Cost of Carbon, United States Government, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866* (February 2010) (“2010 Estimate”).

² 508 F.3d 508 (2007)

Model Years 2008-2011³ was arbitrary and capricious and contrary to the Energy Policy and Conservation Act of 1975 because NHTSA failed to monetize the value of carbon emissions. Specifically, the court held that the value of carbon emissions reductions is not zero. The matter was remanded to NHTSA to promulgate new standards that include a monetized value for the benefit of reducing carbon emissions.

The SCC estimates represent specific monetary values per metric ton of CO₂ intended to be used in regulatory impact analyses required under Executive Order 12866 to estimate the costs and benefits of major federal regulations. The SCC estimate was developed by an Interagency Working Group (IWG) and is based on a number of models and data inputs. The IWG has revised the SCC estimates three different times from 2010 to 2013. OMB has not disclosed the identity of the agencies and entities that made up the IWG.

The IWG and OMB have not disclosed why specific models were selected to generate the SCC estimate or the data inputs and assumptions that were put into the models. Without an understanding as to the process for selecting the models, data inputs and assumptions, RMA is unable to determine whether the SCC estimate is reliable and supportable. We ask that OMB identify the strengths and weaknesses of the DICE, FUND, and PAGE models, identify any inherent biases that exist in the models, and explain the process and rationale for choosing these models. We also ask that OMB provide the data inputs, and explain the process to select the data inputs and rationale for the data inputs that were used in the models.

While RMA appreciates the opportunity to provide public comments on the SCC revised estimate, the public comment period is not fully achieved without the opportunity to know the data inputs for the models used to generate the SCC estimates and the opportunity to provide comment on that data. Several members of Congress have made requests for OMB to provide the data inputs or information necessary to fully evaluate the SCC estimates. To date, OMB has not provided this information.

Despite this public comment period on the Technical Support Document, the U.S. Department of Energy (DOE) is continuing to use the SCC Estimates⁴ in rulemakings. For example, DOE recently proposed energy conservation standards for residential furnace fans. The SCC was used as a basis to justify the residential furnace fans proposed rule. RMA members question whether OMB intends to use the public comment process on the SCC estimates to update and improve the SCC because DOE has not waited for the comment period to close and instead continues to propose rulemakings that include and are supported by the SCC. Additionally, it is not understood from the Technical Support Document, how OMB, the IWG, or other agencies will consider and respond to public comments and ultimately revise SCC estimates. RMA members also do not understand, and seek additional clarification, regarding how OMB will implement the use of revised SCC estimates in future rulemakings.

³ 71 Fed.Reg. 17,566 (Apr. 6, 2006)

⁴ 78 Fed. Reg. 79,419 (Dec. 30, 2013).

II. Use of the SCC estimates in rulemakings violates the Administrative Procedures Act (APA)⁵

Use of the 2010 and 2013 SCC estimates in rulemaking will result in agency violations of the APA. The APA requires a court to set aside agency actions, findings, and conclusions that are found to be arbitrary, capricious, abuses of discretion, not in accordance with law, or without observance of procedure required by law.⁶ It would be arbitrary and capricious for an agency to use the SCC estimates to justify a rulemaking without knowing the rationale and justification for selecting the models, data inputs, and assumptions used to create the SCC estimates. Agencies engaged in rulemaking must articulate why a rule includes or does not include certain requirements. Failure to offer a “rational connection between the facts and judgment,” will render the agency decision arbitrary and capricious under the APA.⁷

Use of the SCC Estimates in rulemaking will not meet the requirements of the APA as interpreted by the courts because the IWG and OMB have not provided a rational connection or sufficient justification for the models, data inputs and assumptions used to create the SCC estimates. To date, stakeholders do not know the roles each of the IWG participating agencies played in developing the estimates. Additionally, stakeholders do not know how the three models that underlie the SCC estimates were selected or the justification for the use of the three models. Last, it is not clear who developed the inputs for the model runs and there is no justification provided as to why the data inputs were selected or justification for the assumptions that were made in the models. This missing information highlights the flaws and uncertainties that preclude the use of the 2010 and 2013 SCC Estimates in agency rulemakings.

III. Revisions of the SCC estimates should be done through a transparent process that includes full peer review

RMA recommends that SCC estimates should be revised through a transparent process that includes full peer review of the data inputs and assumptions. OMB’s Formal Information Quality Bulletin for Peer Review specifies that “peer review is one of the most important procedures to ensure that the quality of published information meets the standards of the scientific and technical community.”⁸ Additionally, EPA recognizes in its Peer Review Handbook that peer reviews are conducted to ensure that activities are technically supportable, competently performed, properly documented, and consistent with established quality criteria.⁹

Peer review of the SCC estimates is needed to ensure that the models were not manipulated and the data inputs and assumptions are defensible. A full peer review of the SCC estimates from 2010 to 2013 may also help to inform stakeholders as to why the May 2013 SCC estimates is 60% higher than the 2010 SCC estimates. RMA again recommends that a full peer

⁵ 5 U.S.C. § 706.

⁶ *Id.*

⁷ *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

⁸ Memorandum for Heads of Departments and Agencies from Josh B. Bolton, Director, OMB “Issuance of OMB’s ‘Final Information Quality Bulletin for Peer Review’” at 2 (Dec. 16, 2004).

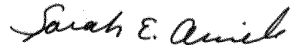
⁹ *Peer Review Handbook, 3rd Edition, Prepared for the U.S. Environmental Protection Agency by Members of the Peer Review Advisory Group for EPA’s Science Policy Council*, EPA/100/B-06/002.

Comments by the Rubber Manufacturers Association
Docket ID OMB-OMB-2013-0007
February 26, 2014

review of the data inputs, assumptions and SCC estimates be conducted, and sufficient justification should be provided for the use of inputs and assumptions that were used in the models.

RMA again thanks OMB for this opportunity to comment on the SCC estimates. Please contact me at (202) 682-4836 if you have questions or require additional information.

Respectfully Submitted,

A handwritten signature in cursive script that reads "Sarah E. Amick".

Sarah E. Amick
Senior Counsel
Rubber Manufacturers Association

This report is a response to a request from Katherine Kiel (Dec. 10, 2014) to review a draft EPA (no date) paper, "Valuing Methane Emission Changes in Regulatory Benefit-Cost Analysis." As part of the request I was provided with the 7 charge questions repeated below in italics, the EPA paper, and the paper: Alex L. Marten, Elizabeth A. Kopits, Charles W. Griffiths, Stephen C. Newbold, and Ann Wolverton, 2014 (on line) Incremental C_4H and N_2O mitigation benefits consistent with the US Government's SC- CO_2 Estimates, *Climate Policy*, which forms the basis for estimates provided in the draft EPA paper.

The basic objective of the EPA paper was to outline a process for establishing a social cost of methane (and possibly N_2O) that is consistent with the established basis for estimating a social cost of carbon previously developed by EPA.

1. *Has EPA correctly interpreted the SC- CH_4 estimates provided in Marten et al. (2014) as designed to measure the monetized value of the climate impacts from marginal changes in CH_4 emissions in a way that is appropriate for use in benefit-cost analysis of regulatory actions projected to change CH_4 emissions?*

The Marten et al. (2014) paper follows closely the original social cost of carbon approach developed by the EPA, using the same 3 IA models, expanding them to include methane and nitrous oxide. EPA's interpretation of the paper appears to be correct. The main addition was an explicit treatment of the lifetime of methane (and nitrous oxide). The formulation used is obviously a simplification of complex atmospheric chemistry but has been used in earlier publications and likely approximates a more complex representation. The *ad hoc* increase in radiative forcing to account for indirect effects is another simplification, and obviously has substantial impacts on the estimates. It is justified by the IPCC indirect estimates. It is not clear that the method includes the fact that abiogenic methane decays into CO_2 and hence may represent an additional impact of methane release. (Biogenic methane also decays into CO_2 but if that methane is derived from plant material that regrows it would then not represent an addition of CO_2 to the atmosphere.)

2. *Do you agree that the Marten et al. SC- CH_4 estimates are consistent with the USG SC- CO_2 estimates?*

While there is considerable controversy about how to estimate a Social Cost of Carbon from a theoretical standpoint as well as the empirical foundation for such an estimate, the method put forward by Marten et al. (2014) is theoretically and empirically consistent with the original Social Cost of Carbon estimates developed by EPA.

3. *Do you agree with EPA's characterization of the limitations of using the global warming potential (GWP) to approximate the SC- CH_4 (and other non- CO_2*

GHGs)?

I agree that using GWP's to scale the social cost of carbon would be theoretically inconsistent. As the EPA (no date) paper discusses, the Social Cost of Carbon method appropriately uses a discount rate to weight damages at different points in time, whereas the GWP approach stops at radiative forcing and then uses an arbitrary time horizon to truncate the effects, weighting effects in each year equally. This leads to the controversy about which GWP time horizon to use. Of course this controversy is not completely avoided as it resurfaces as a controversy about the appropriate discount rate. It appears to turn out that given the time path of damages the 100-year GWP of methane is very similar to the Social Cost of Methane relative to the Social Cost of Carbon as estimated in the Marten et al (2014) paper. (This was a conclusion Reilly and Richards (1993) reached.) With a very different path of damages this result may not hold. For that reason as EPA imagines updating these estimates, and for theoretical consistency, using the Marten et al. (2014) method for arriving at a Social Cost of methane (or nitrous oxide) appears much more defensible.

While it does not affect the basic conclusions, I have some issues with the paragraph in EPA (no date) repeated below in italics, especially the sentences highlighted here in bold.

*Furthermore, the assumptions made in estimating the GWP are not consistent with the assumptions underlying SC-CO₂ estimates in general, including the USG SC-CO₂ estimates. **For example the 100 year time horizon usually used in estimating the GWP is less than the 300 year horizon used in developing the USG SC-CO₂ estimates.** The GWP-approach also treats all impacts within the time horizon equally, independent of the time at which they occur. **This is inconsistent with the role of discounting in economic analysis, which accounts for a basic preference for earlier over later gains in utility, the small but positive probability of a large global catastrophe (e.g., large asteroid collision, super volcanic eruption, nuclear war), and expectations regarding future levels of economic growth.** In the case of CH₄, which has a relatively short lifetime compared to CO₂, the temporal independence of the **GWP could lead the approximation in (2) to underestimate the SC-CH₄ with a larger downward bias under higher discount rates (Marten and Newbold 2012).**¹*

Regarding the inconsistency of the 100- and 300-year horizons: Yes, I suppose this is true but there really is no direct comparison. In the economic analysis one hopefully has a far enough time horizon so that with discounting

¹ We note that the truncation of the time period in the GWP calculation could lead to an overestimate of SC-CH₄ for near term perturbation years in cases where the SC-CO₂ is based on a sufficiently low or steeply declining discount rate.

it is irrelevant. In some sense choice of discount rate is a substitute for the choice of time horizon—the higher the discount rate the shorter the time horizon. In a final version of this paper I might rephrase this as something like. *In the USG SC-CO₂ estimates a 300-year time horizon was used, long enough to minimize its effects on estimates given the discount rates used. In contrast the GWP approach is to truncate estimates at different time horizons (20-, 100-, 500-years), treating all impacts within the time horizon equally, independent of the time at which they occur.* I think this gets across the point you want to make without directly suggesting that the 100-year and 300-year horizons are inconsistent (when in fact that is not even comparable.)

Then the second emboldened sentence raising a huge set of issues and controversies. I think the sentence would be best deleted. The discount rate should not theoretically include the risk of catastrophe. Risks should be separately evaluated with a risk-free discount rate to arrive at an “expected” social cost of carbon, perhaps with a utility function that more heavily weights bad outcomes. While an observed rate of return can include a risk premium based on a specific assessment of the risk (and time profile of the risk) it is inappropriate to apply a risk premium to a discount rate and then apply that risk-adjusted rate to many different investment profiles. Here, different characterizations of when catastrophes may occur. Embedding risk into the discount rate in this manner is little different than using GWP’s with truncated time horizons to implicitly give different weights (1 or 0) to damages occurring at different times. And while in a Ramsey model the discount rate is approximately the sum of the pure rate of time preference plus the growth rate that again is calculation under certainty so using “expected growth” is inconsistent. Then you have the Weitzman argument that with uncertainty in the appropriate discount rate, one should use a declining rate. And bringing up things like asteroid collisions and such just seems distracting here.

Finally, I guess the last emboldened statement is true but it took me a long time to figure it out. A higher discount rate, as compared to a lower rate, will lead to a lower social cost of carbon (or methane). So concluding that it will underestimate the Social Cost of Methane seemed initially backward. Further a higher discount rate, while lowering the social cost of both gases, will tend to raise the Social Cost of Methane relative to that of carbon. But I guess if I fully parse this sentence, you are saying that taking a specific GWP-horizon (e.g 100 years) and deriving a SC of methane by applying it to your existing SC of carbon, then if you were to do this the right way with a high discount rate—that SC of methane would be higher than that derived using the shorthand method. Maybe there is a clearer way to say this...but then I’m not sure why this is important. There seems to be a concern about underestimating the methane value. You could just as easily say, that methane would be overvalued for low discount rates. I’d think you just want the CS of carbon and methane to be consistent and unbiased in either direction.

4. *Do you agree with EPA's assessment that direct estimates of the SC-CH₄, as developed by Marten et al., are more appropriate for monetizing changes in CH₄ emissions than using the GWP to scale the USG SC-CO₂?*

Yes, see above.

5. *Are there other existing approaches for monetizing the benefits (or dis-benefits) to society from reductions (increases) in CH₄ emissions that should be considered in regulatory analysis?*

Not of which I am aware. As the Reilly and Richards (1993) paper referred to in the Marten et al. (2014) paper the multiple impacts of these different gases, beyond climate change, could in principle be incorporated into the analysis but that raises further complications. E.g. CO₂ has some benefit to crop growth (disputed) but ozone (of which methane is a precursor) has not only climate implications but also damages to crops and health. However, with all the recognized limitations to the empirical foundation for the SC estimates, the chosen approach is theoretically sound.

6. *Although the focus of this review is on the application of estimates of the social cost of CH₄ to benefit-cost analysis for regulations, do your answers for the questions above hold for the application of the social cost of N₂O estimates provided in Marten et al.?*

Yes, the method is equally applicable to N₂O.

7. *Are there implementation issues not addressed in the paper that EPA should consider before applying the Marten et al. estimates in regulatory analysis?*

As the paper itself points out, the current approach of using a social cost of 0 is clearly not right and so whatever the limitations of existing methods it seems better to use something rather than nothing. Of course one could use a value that is so high that zero would be preferable, but I don't see that error here. More to the point: Accepting the Social Cost of Carbon estimates, this approach consistently applies the concept to methane (and potentially other GHGs).

John Reilly
MIT

Document Title: Valuing Methane Emission Changes in Regulatory Benefit-Cost Analysis

Approximate Length: 10 pages

Supporting Materials: Marten et al. (2014) (36 pages excluding Appendices)

Abstract and Charge Questions:

Consistent with Executive Order 12866, EPA conducts benefit-cost analysis to inform policy makers and the public about the potential economic implications of regulatory actions. EPA has promulgated regulations that result in changes in CH₄ emissions but has not yet quantified such impacts in its main benefit-cost analyses. Direct estimates of the benefits of mitigating CH₄ emissions have been presented in the scientific literature, but EPA has not used these estimates in benefit-cost analyses because they are inconsistent with U.S. Government (USG) estimates of the social cost of carbon dioxide (SC-CO₂).¹ A recently published paper (Marten et al. 2014) presents estimates of the social cost of CH₄ (SC-CH₄) that are consistent with USG estimates of the SC-CO₂. While it is anticipated that the USG will continue to improve the models and data it uses to estimate the SC-CO₂ in accordance with evolving scientific and economic understanding, the enclosed paper illustrates how EPA could apply the SC-CH₄ estimates from Marten et al. to improve upon the current treatment of methane impacts in regulatory impact analysis (RIA) so that they need not be implicitly assigned a value of zero in policy assessment. Consistent with EPA's peer review guidance, the Agency is seeking review of the application of these new benefit estimates to regulatory analysis before using them in an RIA. Specifically we seek guidance on the following questions:

1. Has EPA correctly interpreted the SC-CH₄ estimates provided in Marten et al. (2014) as designed to measure the monetized value of the climate impacts from marginal changes in CH₄ emissions in a way that is appropriate for use in benefit-cost analysis of regulatory actions projected to change CH₄ emissions?

I have read both Marten et al. (2014) and the review document and feel that the review document provides an accurate summary of the issues and methodologies discussed in Marten et al. (2014). I feel that Table 3 of the review document provides a nice example of how the SC-CH₄ estimates from Marten et al. (2014) could be used in BCAs of proposed regulations and underscores the bias that arises if a GWP-based approach is used rather than the direct approach proposed by Marten et al. (2014).

There, of course, is a whole host of issues that arise when applying any social cost measure to regulatory analyses, which have been extensively discussed in the literature

¹ See the February 2010 Technical Support Document (TSD) and November 2013 TSD Update for a complete discussion of the methods used to develop the USG SC-CO₂ estimates:
<http://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf>,
<http://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf>.

and which I expand on in my responses below. A key issue that I would like to raise here is that these measures are only appropriate for marginal changes in CH₄. These measures are not designed to be used to evaluate non-marginal changes in methane emissions (or any other gas, for that matter). Therefore, caution must be used when applying social cost measures like this.

2. Do you agree that the Marten et al. SC-CH₄ estimates are consistent with the USG SC-CO₂ estimates?

“Consistent” can have many interpretations. I will say that the Marten et al. SC-CH₄ estimates are computed in a similar way as the SC-CO₂ estimates, so in this regard, the two estimates are “consistent.” However, CO₂ is more explicitly modeled in the three models than CH₄ so in this regard they are not “consistent.” However, this inconsistency is due to limitations of the models and I feel that Marten et al. have taken appropriate steps to address these limitations the best way possible. However, gaps still remain and should be recognized.

3. Do you agree with EPA’s characterization of the limitations of using the global warming potential (GWP) to approximate the SC-CH₄ (and other non-CO₂ GHGs)?

The review document (and Marten et al) discusses a number of problems that arise when GWP is used to approximate SC-CH₄: (1) in the introduction and in section 2, the authors point out that the indirect effects of CH₄, as a precursor to tropospheric ozone and stratospheric water vapor, can amplify radiative forcing significantly (which would not be captured in the GWP); (2) GWP ignores important nonlinear relationships beyond radiative forcing in the chain between emissions and damages—e.g., increased agricultural productivity due to CO₂ fertilization would be incorrectly attributed to CH₄ if the GWP was used; (3) GWP does not account for differences in time horizons between gases—e.g., since CH₄ has a shorter lifetime than CO₂, the GWP approach would underestimate the SC-CH₄.

Although all three are technically correct, I feel that (1) and (2) could be addressed to a certain extent (although not perfectly) by adjusting the GWP to account for these biases. However, the temporal issue raised in (3) seems more difficult to address through simple adjustments to the GWP.

In sum, I agree with the authors that problems exist and that the direct approach in theory is the best way to avoid these issues.

4. Do you agree with EPA’s assessment that direct estimates of the SC-CH₄, as developed by Marten et al., are more appropriate for monetizing changes in CH₄ emissions than using the GWP to scale the USG SC-CO₂?

As discussed in my response to question 3 above, I agree that the direct approach is likely a superior approach to the indirect GWP approach. However, it should be noted that the direct approach has issues as well. Namely, as discussed in section 3, most models do not include an atmospheric stock-flow model of CH₄; thus, the authors were forced to develop a separate model to project the path of radiative forcing from a CH₄ perturbation, and then incorporate this path into the IAM exogenously. As a result, indirect or feedback effects are missed. For instance, climate change impacts on agriculture will affect methane emissions.

In sum, no approach is perfect but in my opinion, the “direct” approach used by Marten et al is preferred to the indirect GWP approach for the reasons outlined in the review document. However, the EPA should continue to seek improvements to the direct approach put forth by Marten et al.

5. Are there other existing approaches for monetizing the benefits (or dis-benefits) to society from reductions (increases) in CH₄ emissions that should be considered in regulatory analysis?

My complaint with past SC measures is the use of highly aggregated and stylized models to monetize the benefits of reductions. By using models that represent the global economy as one aggregate sector, we are missing important subsector interactions and distributional effects that can only be captured with a more disaggregated model, such as a computable general equilibrium model. My sense would be that these SC would be much higher if a more disaggregated model was used. Modeling the economy as one monolithic sector implies, for instance, perfect substitutability across subsectors which will underestimate the cost of damages. It also assumes perfect trade which can also underestimate the cost of damages. (See Chapter 6 of the IPCC WGIII Fifth Assessment Report which highlights some of these biases that arise with alternative model characteristics).

The use of these simplified models for SC estimates, I believe, is a large source of the criticisms we’ve seen with respect to the SCC reports. The use of more sophisticated economic models (like those used in the IPCC) is needed, in my opinion.

6. Although the focus of this review is on the application of estimates of the social cost of CH₄ to benefit-cost analysis for regulations, do your answers for the questions above hold for the application of the social cost of N₂O estimates provided in Marten et al.?

Yes.

7. Are there implementation issues not addressed in the paper that EPA should consider before applying the Marten et al. estimates in regulatory analysis?

I am not sure I would characterize these as “implementation” issues, but I do want to take this opportunity to stress the importance of being forthcoming with the shortcomings of these SC estimates. These shortcomings are not specific to any gas.

- (1) As discussed in my response to question 1, these estimates are not appropriate for evaluating large (non-marginal) changes in emissions of any of these gases.*
- (2) As discussed in my response to question 5, the SC values will be underestimated due to the use of highly aggregated models.*
- (3) These estimates do not take into account extreme or threshold events, which could amplify the estimates significantly.*
- (4) These estimates will be biased downward due to the omissions of nonmarket values and omitted impacts, and will be biased upward due to the lack of adaptation responses (although FUND does account for some of this).*

To: Sarofim, Marcus[Sarofim.Marcus@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Shouse, Kate
Sent: Tue 7/14/2015 7:48:52 PM
Subject: thanks

For joining the call and responding to questions, it was very helpful.

I didn't appreciate how easy it is to get tongue tied with SC-CO2 compared to SCC. Yikes.

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Cropper, Maureen
Sent: Tue 7/7/2015 1:04:08 PM
Subject: Who Performed the Computations for the SCC?

Elizabeth,

Who performed the actual computations for the SCC? Were they performed by EPA staff or someone else?

I hope all is well with you!

With best wishes,
Maureen

To: Li, Jia[Li.Jia@epa.gov]
Cc: Wolverton, Ann[Wolverton.Ann@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Fawcett, Allen[Fawcett.Allen@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 1/13/2015 1:19:46 PM
Subject: RE: New Stanford study showing SCC six times higher than USG estimates

FYI - More press on this paper. Includes comment from Billy....

POLICY:

Researchers say the social cost of carbon will be 6 times the Obama administration's estimate
Evan Lehmann, E&E reporter
Published: Tuesday, January 13, 2015

Climate change could have much larger impacts on the economy than the U.S. government is anticipating, according to an analysis released yesterday that suggests the social cost of carbon should be six times higher.

A paper by two Stanford University researchers argues that the true cost of releasing greenhouse gases is about \$220 a ton because rising temperatures could badly hinder a nation's economic growth over decades or centuries. The Obama administration estimates that the social cost of carbon is \$37 a ton.

The paper, published yesterday in the journal *Nature Climate Change*, adds to a growing number of voices calling for improvements to the complicated process of establishing the cost estimate, which is used to measure the benefits of regulations. A dozen federal agencies set the price using three computer models that project emission rates, economic activity and climate damages.

The Stanford paper bases its findings on prior research showing that the economic health of a country suffers during periods of high temperatures. Heat can harm agricultural and industrial output, while increasing political instability. In that way, the Stanford analysis subscribes to emerging calls among experts to incorporate new observations into the trio of models that date back to the 1990s.

"The social cost of carbon is almost certainly larger of what's being used so far," said co-author Frances Moore, a doctoral candidate at Stanford's School of Earth Sciences.

In a key departure from the government's analysis, the paper uses the previous empirical research to assert that climate impacts could damage a nation's economic growth rate over time, rather than just harassing its year-to-year economic output.

That could mean that nations face permanent malfunctions, like economic declines in labor, capital and technology from severe weather and other "temperature shocks." The authors say these bigger impacts have a "compounding effect" that is more damaging to the economy than temporary strains from heat on agricultural output and more expensive air conditioning costs.

"So the economy is kind of permanently lower," Moore said. "If you have repeated shocks, in that case, they accumulate over time. That's why even very, very small reductions in growth rates have these really big effects over time."

It's an 'overestimate'

The social cost of carbon is used in the cost-benefit analysis of some federal regulations. If the impact of emissions is deemed expensive for society, it could justify more aggressive policies to reduce their release by industry. Opponents of climate action criticized the Obama administration for raising the social cost of carbon in 2013 by almost 50 percent.

William Pizer, a Duke University professor and former Obama administration official who has worked on the estimate, applauded the Stanford researchers for applying updated observations into their carbon estimates. He and several other former Obama advisers say the administration should improve its use of updated science when establishing the price.

But Pizer also questioned the methodology of the Stanford analysis. The empirical research it relied on tracked short-term temperature spikes and their impacts on nations' economies -- not long-term trends that might show permanent economic reductions.

"To me, it just seems like it has to be an overestimate," Pizer said of the Stanford result of \$220.

"I think it's great they're doing this," he added. "I just think this is another data point that someone needs to weigh as they're trying to figure out what the right social cost of carbon is. But this isn't like a definitive new answer."

Moore acknowledged the uncertainties in her research. For example, she noted that there's not enough evidence to know if climate change will continue to have outsized impacts on poorer countries or if as their economies grow they'll be able to adapt and decrease their damage.

A grimmer outcome consists of "biophysical temperature thresholds" -- the idea that the heat will prevent large economic advances. Both scenarios effect the speed and aggressiveness with which emissions should be reduced -- and the price of their social cost of carbon.

Moore hopes the new research will help inform the administration that a larger spectrum of damages should be considered when establishing the monetary estimate.

-----Original Message-----

From: Kopits, Elizabeth

Sent: Monday, January 12, 2015 3:39 PM

To: Li, Jia

Cc: Wolverton, Ann; Griffiths, Charles; Shouse, Kate; Fawcett, Allen; Marten, Alex; Newbold, Steve

Subject: RE: New Stanford study showing SCC six times higher than USG estimates

I hadn't. Thanks for sending. Here's the Nature Climate Change article.

-----Original Message-----

From: Li, Jia

Sent: Monday, January 12, 2015 2:26 PM

To: Kopits, Elizabeth; Shouse, Kate; Fawcett, Allen; Marten, Alex; Newbold, Steve

Subject: New Stanford study showing SCC six times higher than USG estimates

FYI - you may have seen the study

<http://www.rtcc.org/2015/01/12/social-cost-of-carbon-six-times-higher-than-thought-study/>

Sent from my iPhone

To: Marten, Alex[Marten.Alex@epa.gov]
From: Griffiths, Charles
Sent: Tue 1/27/2015 6:13:27 PM
Subject: Re: Extreme weather draft

Thanks, Alex. I would be happy for you to engage at any point you wish but, honestly, I don't think we need more than one individual reading and commenting on this at this point. When we get a more complete draft I'll let you know and you can read it at that point.

Charles

From: Marten, Alex
Sent: Tuesday, January 27, 2015 6:12 AM
To: Griffiths, Charles
Subject: Fw: Extreme weather draft

Charles,

To be honest, I have completely pushed this work to the back of my mind. Please let me know when it's a stage you would like me to engage.

Thanks.

--
Alex Marten
marten.alex@epa.gov

From: Heninger, Brian
Sent: Monday, January 26, 2015 5:02 PM
To: Griffiths, Charles; Marten, Alex
Subject: Fw: Extreme weather draft

Given Matt's comments, I wouldn't put too much, if any time into this, and recall we are NOT meeting tomorrow at 10:00. But if you do have any thoughts on the direction he is taking in this draft, let me know, and I will reply to him.

To: Marten, Alex[Marten.Alex@epa.gov]
From: Griffiths, Charles
Sent: Tue 1/27/2015 6:13:27 PM
Subject: Re: Extreme weather draft

Thanks, Alex. I would be happy for you to engage at any point you wish but, honestly, I don't think we need more than one individual reading and commenting on this at this point. When we get a more complete draft I'll let you know and you can read it at that point.

Charles

From: Marten, Alex
Sent: Tuesday, January 27, 2015 6:12 AM
To: Griffiths, Charles
Subject: Fw: Extreme weather draft

Charles,

To be honest, I have completely pushed this work to the back of my mind. Please let me know when it's a stage you would like me to engage.

Thanks.

--
Alex Marten
marten.alex@epa.gov

From: Heninger, Brian
Sent: Monday, January 26, 2015 5:02 PM
To: Griffiths, Charles; Marten, Alex
Subject: Fw: Extreme weather draft

Given Matt's comments, I wouldn't put too much, if any time into this, and recall we are NOT meeting tomorrow at 10:00. But if you do have any thoughts on the direction he is taking in this draft, let me know, and I will reply to him.

Thanks, -Brian

From: Matthew Ranson <Matthew_Ranson@abtassoc.com>

Sent: Monday, January 26, 2015 3:30 PM

To: Heninger, Brian

Subject: SCC: Extreme weather draft

Hi Brian,

As promised, here's our current working draft of the extreme weather report. We've added a lot of material, rearranged subsections, and added a bunch of internal comments and notes. Since this is very much a messy work-in-progress, I wouldn't recommend distributing to the SCC team for review yet--better to wait until we have a solid draft.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

Thanks, -Brian

From: Matthew Ranson <Matthew_Ranson@abtassoc.com>

Sent: Monday, January 26, 2015 3:30 PM

To: Heninger, Brian

Subject: SCC: Extreme weather draft

Hi Brian,

As promised, here's our current working draft of the extreme weather report. We've added a lot of material, rearranged subsections, and added a bunch of internal comments and notes. Since this is very much a messy work-in-progress, I wouldn't recommend distributing to the SCC team for review yet--better to wait until we have a solid draft.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Barron, Alex[Barron.Alex@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: McGartland, Al
Sent: Fri 3/13/2015 2:32:52 AM
Subject: Re: any interest in co-locating for tomorrow's scc call?

Ex 5

Sent from my iPhone

On Mar 12, 2015, at 6:04 PM, Barron, Alex <Barron.Alex@epa.gov> wrote:

I am happy to offer my office or come to you.

Sent from my iPhone

On Mar 12, 2015, at 5:26 PM, Marten, Alex <Marten.Alex@epa.gov> wrote:

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

To: Heninger, Brian[Heninger.Brian@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
From: Matthew Ranson
Sent: Mon 3/2/2015 7:58:58 PM
Subject: SCC: Extreme weather report
Extreme Weather Lit Review Draft - 2015-03-02.docx

Hi all,

I'm attaching our most recent draft of the extreme weather paper. This is purely for your reference--I don't think it would be a good use of your time to give us specific edits yet, since the document is still in progress.

The main thing that I'd like to discuss with you tomorrow is the

Ex 5

Ex 5

Ex 5

and organizing the paper, too.

Talk to you at 10,

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Heninger, Brian[Heninger.Brian@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
From: Matthew Ranson
Sent: Mon 3/2/2015 7:58:58 PM
Subject: SCC: Extreme weather report
Extreme Weather Lit Review Draft - 2015-03-02.docx

Hi all,

I'm attaching our most recent draft of the extreme weather paper. This is purely for your reference--I don't think it would be a good use of your time to give us specific edits yet, since the document is still in progress.

The main thing that I'd like to discuss with you tomorrow is

Ex 5

Ex 5

Ex 5

and organizing the paper, too.

Talk to you at 10,

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Matthew_Ranson@abtassoc.com[Matthew_Ranson@abtassoc.com]
Cc: Kuhn, Jennifer J.[Kuhn.Jennifer@epa.gov]; Turner, Cathy[Turner.Cathy@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
From: Heninger, Brian
Sent: Tue 1/13/2015 8:39:34 PM
Subject: Technical Direction WA #4-87, Contract #EP-W-11-003, Task #2
Extreme Weather Lit Review Draft - 2015-01-11 (cwg) _ek.docx

Hi Matt,

Technical Direction WA #4-87, Contract #EP-W-11-003, Task #2

Ex 5

Please feel free to contact me with any questions or concerns.

Thanks, -Brian Heninger

WA-COR – WA #4-87, Contract #EP-W-11-003

Brian Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

To: Griffiths, Charles[Griffiths.Charles@epa.gov]; Heninger, Brian[Heninger.Brian@epa.gov];
Marten, Alex[Marten.Alex@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 1/13/2015 2:34:20 PM
Subject: RE: SCC - Extreme weather report draft
Extreme Weather Lit Review Draft - 2015-01-11 (cwq) _ek.docx

And some initial comments from me.

Elizabeth

From: Griffiths, Charles
Sent: Monday, January 12, 2015 11:15 AM
To: Heninger, Brian; Kopits, Elizabeth; Marten, Alex
Subject: RE: SCC - Extreme weather report draft

Enclosed are my comment on the extreme weather draft.

Charles

Charles Griffiths
National Center for Environmental Economics
Room 4334B, WJC West, Mail Code 1809T
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Phone: 202/566-2288 Fax: 202/566-2338

Email: griffiths.charles@epamail.epa.gov

From: Matthew Ranson [mailto:Matthew_Ranson@abtassoc.com]

Sent: Sunday, January 11, 2015 1:34 PM

To: Heninger, Brian; Kopits, Elizabeth; Marten, Alex; Griffiths, Charles

Cc: Lisa Tarquinio

Subject: SCC - Extreme weather report draft

Hi all,

I'm attaching a revised version of the

Ex 5

Ex 5

Any comments you have on this version would be great. Also, I think it would be helpful to us if

Ex 5

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Marten, Alex[Marten.Alex@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]
From: Kopits, Elizabeth
Sent: Mon 7/13/2015 4:39:33 PM
Subject: FW: Thanks, and some ideas for the future
[removed.txt](#)

Ex 5

From: Karen Carney [mailto:KCarney@stratusconsulting.com]
Sent: Monday, July 13, 2015 12:35 PM
To: Snyder, Brett; Kopits, Elizabeth; Heninger, Brian
Cc: Matthew Ranson; David Chapman; Michael Fisher
Subject: Thanks, and some ideas for the future

Dear Brett, Elizabeth and Brian,

It was great meeting you all and hearing about the work you do. We at Stratus/AER are thrilled to join colleagues at Abt that are contributing to the important and interesting projects and programs you all have been leading. Along those lines, our meeting and related discussions generated a range of ideas for how our newly combined organization might support your group moving forward. For example, we could:

1. Further your efforts in conducting sector specific analyses for the SCC related to wildfire, ecosystems, and nonlinear dynamics;
2. Develop a white paper that examines the US policy contexts in which IAMs versus more detailed, CIRA type analyses are most appropriate; or
3. Develop a scoping paper assessing the need and desire for an additional/EPA developed IAM. Our efforts, which would be conducted much like a formative evaluation or market analysis, would seek to clarify (1) what an EPA developed IAM would add/include that other IAMs are currently lacking, (2) how much demand exists for these 'new' characteristics, (3) how much the development of a new IAM would cost, and (4) whether improvements to existing IAMs could be made in lieu of a new IAM, and (5) the relative cost and benefits of developing a new IAM vs. modifying an existing one.

Regarding #3 above, we have been involved in a wide range of evaluations, including formative, summative, and real-time evaluations, and would be excited to put our skills and experience to use in this context.

We realize that times are tight and that you may not have the funding or bandwidth to deal with any of these ideas at this juncture. However, if any of them pique your interest and you would like to hear more detail about what each analysis would deliver and how, we would welcome the opportunity to develop a short concept paper for your consideration.

Thanks for your time, and we look forward to working together in the future.

Best wishes,

Karen Carney

Matt Ranson

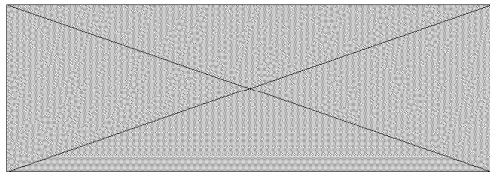
David Chapman

Michael Fisher

Karen Carney, Ph.D. | Managing Scientist | Abt Environmental Research

1881 Ninth Street, Suite 201 | Boulder, Colorado 80302

Direct: 802.355.4951 | Office: 303.381.8000 | Fax: 303.381.8200 | www.abtassociates.com



This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: McGartland, Al[McGartland.Al@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov];
Wolverton, Ann[Wolverton.Ann@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: Marten, Alex
Sent: Wed 4/1/2015 5:10:17 PM
Subject: scc does grow slower than discount rate

Ex 5

Ex 5

Turns out Heather just had a spreadsheet typo.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

To: Heninger, Brian[Heninger.Brian@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Bcc: griffiths.charles.epa@gmail.com[griffiths.charles.epa@gmail.com]
From: Griffiths, Charles
Sent: Mon 5/4/2015 2:39:32 PM
Subject: RE: SCC update

Ex 5

Charles

Charles Griffiths
National Center for Environmental Economics
Room 4334B, WJC West, Mail Code 1809T
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Phone: 202/566-2288 Fax: 202/566-2338
Email: griffiths.charles@epamail.epa.gov

From: Heninger, Brian
Sent: Monday, May 04, 2015 8:18 AM
To: Marten, Alex; Griffiths, Charles
Subject: RE: SCC update

Ex 5

I can not make a 10 Tuesday call this week due to **Non-Responsive** that same 2 hour block. But we can set something up with Matt soon is needed.

I will reply to Matt in the meantime, just so he knows we got this, and will get back to him.

Others opinions welcome.

-Brian

Brian Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

From: Marten, Alex
Sent: Friday, May 01, 2015 9:40 PM
To: Heninger, Brian; Griffiths, Charles
Subject: Fw: SCC update

Brian and Charles

Ex 5

--

Alex Marten
marten.alex@epa.gov

From: Matthew Ranson <Matthew_Ranson@abtassoc.com>
Sent: Friday, May 1, 2015 9:17:49 PM
To: Heninger, Brian
Cc: Griffiths, Charles; Marten, Alex; Lisa Tarquinio; Audrey Lew
Subject: RE: SCC update

Hi Brian,

I'm pleased to send you a near-complete draft of the extreme weather report. I've added some notes for you in a couple of places, but except for that it's a clean copy. As I mentioned in my previous email, I think the report is at a point where it would be good for you and the NCEE SCC team to review carefully.

We'll plan to hold off on any further work until we hear back from you. Please let me know if you would like to set up a meeting in the next couple of weeks, either as a prelude to your review, or once you have comments.

Lisa and Audrey and I will look forward to your thoughts and suggestions about the document.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Matthew Ranson

Sent: Wednesday, April 29, 2015 10:33 AM

To: Brian Heninger <Heninger.Brian@epa.gov>

Cc: Griffiths, Charles (Griffiths.Charles@epa.gov); Alex Marten (Marten.Alex@epa.gov)

Subject: SCC update

Hi Brian,

Ex 5

I'm planning to send you a complete, clean draft of the SCC report by Monday morning. It has come a long way since the last version, in terms of coverage of analytical and empirical topics in the literature. It has also gotten quite long--I think it's about 90 pages right now. However, we've tried hard to smooth out the writing, and have moved a lot of material into appendices.

Overall, I think it's turned into a pretty good report. I think a useful next step would be for you and the SCC team to review the document carefully, and let us know what further comments and

Ex 5

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
From: Marten, Alex
Sent: Mon 7/13/2015 6:31:35 PM
Subject: RE: sometime soon..

I think I've done all I can on the general SCC and FUND front here. I have suggested some changes to the naming structure in the README and have implemented accordingly.

I will circle back to the

Ex 5

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Kopits, Elizabeth
Sent: Wednesday, July 01, 2015 8:00 AM
To: Marten, Alex; Newbold, Steve; Griffiths, Charles
Subject: sometime soon..

Can you please put a copy of the revised source code and results for the SCC model runs in appropriate folders within G:\USG SC-GHG\2013 USG SCC Update\ ? (I started to create some blank folders, but feel free to add more or rename as needed.)

I think it's important to keep this organized so we can respond quickly if/when anyone asks for it. Also, please organize any emails/files you have concerning the QAQC of the runs. If any of these are easy to add to the folder on the share drive as well, I think that would be a good idea too.

Elizabeth

To: Heninger, Brian[Heninger.Brian@epa.gov]; Matthew Ranson[Matthew_Ranson@abtassoc.com]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Griffiths, Charles
Sent: Wed 3/18/2015 12:32:17 PM
Subject: RE: Status update

Can we possibly push it to April 14th. I will be taking annual leave the week of the 7th to lead a

Ex 6 - Other

Thanks,

Charles

From: Heninger, Brian
Sent: Tuesday, March 17, 2015 8:09 AM
To: Matthew Ranson
Cc: Marten, Alex; Griffiths, Charles
Subject: RE: Status update

OK, Thanks Matt. It's good to see where you are in the paper.

We'll talk on 4/7, 10:00.

-Brian

From: Matthew Ranson
Sent: Monday, March 16, 2015 10:21 PM
To: Heninger, Brian
Cc: Marten, Alex; Griffiths, Charles
Subject: RE: Status update

Ex 4

Hi all,

Most recent draft is attached. As I mentioned, the

Ex 5

Ex 5

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Matthew Ranson
Sent: Monday, March 16, 2015 5:20 PM
To: 'Heninger, Brian'
Cc: Marten, Alex; Griffiths, Charles
Subject: RE: Status update

Hi Brian,

Sure, let's plan to meet in three weeks (4/7). At that point we will have a lot to discuss. Just to keep you informed about where we are in the paper, I'll plan to send you a draft today and another one in two weeks.

Enjoy spring break,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Heninger, Brian [<mailto:Heninger.Brian@epa.gov>]

Sent: Monday, March 16, 2015 3:20 PM

To: Matthew Ranson

Cc: Marten, Alex; Griffiths, Charles

Subject: RE: Status update

OK on skipping tomorrow.

However, two weeks from tomorrow, I will be on Spring Break. (Several schools around here have break that week.) So depending on your progress, we can talk in 8 days (3/24) or wait three weeks until 4/7. If you just moving along on filling in the sections, then three weeks should be fine.

Let me know what works best for the progress you are making. We don't have any pressing issues or questions (unless Charles or Alex disagrees.) So why don't you let us know which of above suggestions works best.

Thanks, -Brian

From: Matthew Ranson

Ex 4

Sent: Monday, March 16, 2015 3:03 PM

To: Heninger, Brian

Cc: Marten, Alex; Griffiths, Charles

Subject: SCC: Status update

Hi Brian,

Just wanted to give you a status update on the extreme weather work. We have continued to work on the paper, Ex 5 I am reviewing today, and will send you a draft later in the day.

Unless there is something that you want to discuss, I think we could skip our meeting tomorrow. Maybe we can plan to meet two weeks from tomorrow?

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Matthew Ranson[Matthew_Ranson@abtassoc.com]; Heninger, Brian[Heninger.Brian@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
Bcc: griffiths.charles.epa@gmail.com[griffiths.charles.epa@gmail.com]
From: Griffiths, Charles
Sent: Mon 3/2/2015 8:08:41 PM
Subject: RE: Extreme weather report

Thank you.

Charles Griffiths
National Center for Environmental Economics
Room 4334B, WJC West, Mail Code 1809T
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Phone: 202/566-2288 Fax: 202/566-2338
Email: griffiths.charles@epamail.epa.gov

From: Matthew Ranson [mailto:Matthew_Ranson@abtassoc.com]
Sent: Monday, March 02, 2015 2:59 PM
To: Heninger, Brian
Cc: Marten, Alex; Griffiths, Charles
Subject: SCC: Extreme weather report

Hi all,

I'm attaching our most recent draft of the extreme weather paper. This is purely for your reference--I don't think it would be a good use of your time to give us specific edits yet, since the document is still in progress.

Ex 5

Talk to you at 10,

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Kime, Robin[Kime.Robin@epa.gov]
From: Kopits, Elizabeth
Sent: Wed 7/15/2015 3:25:35 PM
Subject: Can we schedule a check in meeting with Joel re: SCC-NAS?

Hi Robin,

Per the conversation regarding SCC in yesterday's bi-weekly, can we get on Joel's calendar to

Ex 5

Ex 5 In addition to Joel and Kevin, I think the folks to include are: Al, me, Alex, Steve, Charles, and Ann. Perhaps early in the week of the 27th if possible?

Thanks!

Elizabeth

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Kime, Robin
Sent: Wed 7/15/2015 3:26:42 PM
Subject: RE: Can we schedule a check in meeting with Joel re: SCC-NAS?

Hi- sounds good- I'll take it from here.

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 11:26 AM
To: Kime, Robin
Subject: Can we schedule a check in meeting with Joel re: SCC-NAS?

Hi Robin,

Per the conversation regarding SCC in yesterday's bi-weekly, can we get on Joel's calendar to

Ex 5

Ex 5

In addition to Joel and Kevin, I think the folks to include are: Al, me, Alex, Steve, Charles, and Ann. Perhaps early in the week of the 27th if possible?

Thanks!

Elizabeth

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Shouse, Kate
Sent: Wed 7/15/2015 1:06:49 PM
Subject: RE: question from Robin K for website for SCC info

Agreed. We do not have a separate SC-non-CO2 page and I envisioned adding it to the SC-CO2 page. In May, I drafted some text for a paragraph that would go at the bottom of the page. Haven't revisited this paragraph since adding the SC-CO2 updates but will likely start with it for any SC-non-CO2 updates:

Ex 5

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 8:59 AM
To: Shouse, Kate
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Yes, I can put this on his radar again. But I think any updates should trail Landfills signature.

Do we already have a separate SC-non CO2 page, or are we creating one, or would it just be added to the SC-CO2 page?

From: Shouse, Kate
Sent: Wednesday, July 15, 2015 8:42 AM
To: Kopits, Elizabeth
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Thanks and that's a good idea and easy enough to do. This reminds me that I don't think we closed out on the question of SC-CH4 updates on the web. While you were on leave, we discussed posting a pdf of the SC-CH4 letter review to the EPA SCC website. OP management didn't seem to have concerns about it but I think you wanted to check back with Joel to confirm. Have you had a chance to do so or can you put this on his radar soon?

Thanks,
Kate

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 8:36 AM
To: Shouse, Kate; Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Thanks, Kate. I think it looks good, and have just one comment.

If/when you can make any edits to it, think it would be nice to also embed a link to the main OMB SCC webpage (<https://www.whitehouse.gov/omb/oira/social-cost-of-carbon>) - maybe at the very end? Right now you have direct links to a few of the documents, but I think a link to the main page would be helpful too in case someone is interested in all versions of the TSD, earlier blog post etc. And presumably, new developments will be added to this same page.

Thanks,
Elizabeth

From: Shouse, Kate
Sent: Wednesday, July 15, 2015 8:24 AM

To: Kopits, Elizabeth; Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Hi, everyone. The updates to EPA's SCC website are now live – please see <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> and let me know if you have any questions (or see anything amiss). Thanks!

From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 4:05 PM
To: Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Hi Jenny and Robin,

If you are looking for an EPA website on SCC, it is:
<http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> . However, I don't think this has been updated yet to reflect the recent revision, etc. Kate Shouse (ccd above) might be able to tell you when we are likely to update it.

However, the 7/2 OMB blog post (<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>) provides the most recent info and includes links to the current TSD and response to public comments received through the recent OMB comment solicitation.

Hope this helps.

Thanks,

Elizabeth

From: Bowen, Jennifer
Sent: Thursday, July 09, 2015 3:57 PM
To: Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: question from Robin K for website for SCC info

What is the best website to point folks to for more info re: SCC?

Thank you.

Jenny

To: O'Connell, MaryEllen[moconnell@nas.edu]; Hodson, Elke[Elke.Hodson@Hq.Doe.Gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Linn, Joshua
Sent: Wed 7/1/2015 6:45:35 PM
Subject: RE: announcement

Thank you, Mary Ellen, for bringing this to our attention (and thanks Elizabeth for forwarding this to Jim while I was in meetings). We will make the changes in the response to comments and the other documents. The plan remains to do the announcement Thursday (tomorrow).

From: O'Connell, MaryEllen [mailto:moconnell@nas.edu]
Sent: Wednesday, July 01, 2015 1:35 PM
To: Linn, Joshua; Hodson, Elke; Kopits, Elizabeth
Subject: RE: announcement

Josh – Is the announcement still slated for Thursday and if so, can you make the changes listed below?:

Ex 5

Ex 5

Ex 5

Thanks, Mary Ellen

From: Linn, Joshua [EOP email/phone]
Sent: Tuesday, June 16, 2015 4:42 PM
To: O'Connell, MaryEllen; Hodson, Elke; Kopits, Elizabeth
Subject: announcement

Mary Ellen,

I just want to give you an update that the publication of the response to comments and the announcement of the NAS plan could happen as early as this Friday, but perhaps early next week. I'll let you know as soon as we set the date. Either way, there shouldn't be any substantive changes to the announcement from the version I sent you previously.

Do you have a sense of when we can expect the proposal and budget?

We are working on names ...

Josh

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov];
From: Laity, Jim
Sent: Wed 7/1/2015 6:00:33 PM
Subject: RE: announcement

EOP email/phone

What a pain, I'll take care of it.

From: Kopits, Elizabeth [mailto:Kopits.Elizabeth@epa.gov]
Sent: Wednesday, July 01, 2015 1:45 PM
To: Linn, Joshua; Laity, Jim
Subject: RE: announcement
Importance: High

Ex 5

Jim – Mary Ellen just told us that as of today, they are no longer the National Research Council and are instead the “National Academies of Sciences, Engineering and Medicine” so we need to change how we refer to them –i.e., “National Academies of Sciences, Engineering and Medicine” instead of “National Academy of Sciences’ National Research Council”, and “Academies” instead of “NRC” for short.

From: O'Connell, MaryEllen [mailto:moconnell@nas.edu]
Sent: Wednesday, July 01, 2015 1:35 PM
To: 'Linn, Joshua'; Hodson, Elke; Kopits, Elizabeth
Subject: RE: announcement

Josh – Is the announcement still slated for Thursday and if so, can you make the changes listed below?:

Ex 5

Ex 5

Thanks, Mary Ellen

From: Linn, Joshua EOP email/phone
Sent: Tuesday, June 16, 2015 4:42 PM
To: O'Connell, MaryEllen; Hodson, Elke; Kopits, Elizabeth
Subject: announcement

Mary Ellen,

I just want to give you an update that the publication of the response to comments and the announcement of the NAS plan could happen as early as this Friday, but perhaps early next week. I'll let you know as soon as we set the date. Either way, there shouldn't be any substantive changes to the announcement from the version I sent you previously.

Do you have a sense of when we can expect the proposal and budget?

We are working on names ...

Josh

To: 'Linn, Joshua' [EOP email/phone] Hodson, Elke[Elke.Hodson@Hq.Doe.Gov];
Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: O'Connell, MaryEllen
Sent: Wed 7/1/2015 5:35:02 PM
Subject: RE: announcement

Josh – Is the announcement still slated for Thursday and if so, can you make the changes listed below?:

Ex 5

Ex 5

Thanks, Mary Ellen

From: Linn, Joshua [EOP email/phone]
Sent: Tuesday, June 16, 2015 4:42 PM
To: O'Connell, MaryEllen; Hodson, Elke; Kopits, Elizabeth
Subject: announcement

Mary Ellen,

I just want to give you an update that the publication of the response to comments and the announcement of the NAS plan could happen as early as this Friday, but perhaps early next week. I'll let you know as soon as we set the date. Either way, there shouldn't be any substantive changes to the announcement from the version I sent you previously.

Do you have a sense of when we can expect the proposal and budget?

We are working on names ...

Josh

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Cc: Fawcett, Allen[Fawcett.Allen@epa.gov]
From: Shouse, Kate
Sent: Tue 5/26/2015 5:53:22 PM
Subject: Re: SCC - draft Desk statements and updated Q&A

Thanks, Elizabeth. I don't have anything beyond your edits. Copying Allen as an FYI (I sent him the attachments separately).

From: Kopits, Elizabeth
Sent: Tuesday, May 26, 2015 1:45 PM
To: Barron, Alex
Cc: Shouse, Kate; Marten, Alex; McGartland, Al; Beauvais, Joel
Subject: RE: SCC - draft Desk statements and updated Q&A

OK, great. Can I go ahead and send?

From: Barron, Alex
Sent: Tuesday, May 26, 2015 1:44 PM
To: Kopits, Elizabeth
Cc: Shouse, Kate; Marten, Alex; McGartland, Al; Beauvais, Joel
Subject: Re: SCC - draft Desk statements and updated Q&A

Fine by me.

Sent from my iPhone

On May 26, 2015, at 1:31 PM, Kopits, Elizabeth <Kopits.Elizabeth@epa.gov> wrote:

Thanks, Alex. These look great. Just two remaining thoughts from me-

Ex 5

- Also, I fixed two minor typos on the last page of the Q&A – see attached.

E.

From: Barron, Alex
Sent: Tuesday, May 26, 2015 1:21 PM
To: Kopits, Elizabeth
Cc: Shouse, Kate; Marten, Alex; McGartland, Al; Beauvais, Joel

Subject: RE: SCC - draft Desk statements and updated Q&A

Just a few edits, since OMB/CEA will likely tweak. I think they would appreciate these drafts before 4pm today, if we can get them over there.

A

From: Kopits, Elizabeth
Sent: Thursday, May 21, 2015 1:05 PM
To: Barron, Alex; Beauvais, Joel
Cc: Shouse, Kate; Marten, Alex; McGartland, Al
Subject: SCC - draft Desk statements and updated Q&A

Hi Joel and Alex B.,

Attached are 2 draft desk statements – one on the RTC/NAS and one on the revised TSD.

Also, I pulled all the Q&A into one document – now with 3 sections: Q&A on the RTC, TSD revision, and NAS process. I have attached both a clean and tracked changes version of it so you that you can see what has been added since the version I sent to OMB/CEA on Tuesday.

Please let me know if you have any edits, and once it is all set I am also happy to pass along to Josh and Jim.

Thanks,

Elizabeth

From: Shouse, Kate
Sent: Thursday, May 21, 2015 12:57 PM

To: Kopits, Elizabeth; Marten, Alex
Subject: RE: draft Desk statements and updated Q&A

Ditto, thanks.

From: Kopits, Elizabeth
Sent: Thursday, May 21, 2015 12:54 PM
To: Marten, Alex; Shouse, Kate
Subject: RE: draft Desk statements and updated Q&A

Thanks! Looks good to me.

From: Marten, Alex
Sent: Thursday, May 21, 2015 12:23 PM
To: Kopits, Elizabeth; Shouse, Kate
Subject: RE: draft Desk statements and updated Q&A

A few thoughts on the desk statements. I don't think I'll have time to look at the Q&As unless one of you really wants me to.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Kopits, Elizabeth
Sent: Thursday, May 21, 2015 11:33 AM
To: Marten, Alex; Shouse, Kate
Subject: draft Desk statements and updated Q&A

Kate – Thanks again for drafting the desk statements! Attached are my few edits on these.

Also I pulled all Q&A into one document – now with 3 sections: q&a on the RTC, TSD revision, and NAS process. I think it might just be easier to have them all in one place. I have attached both a clean and tracked changes version of it.

Let me know what you both think. Then I'll send along to Alex B. etc.

Thanks!

E.

<QA OMB RTC_5 21 15_ab_ek.docx>

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Shouse, Kate
Sent: Wed 7/15/2015 7:08:36 PM
Subject: RE: question from Robin K for website for SCC info

Sounds good, thanks.

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 2:10 PM
To: Shouse, Kate; Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Yes. Good point. And good plan. We will try to get Joel's attention on this and show him the suggested paragraph.

Thanks!

From: Shouse, Kate
Sent: Wednesday, July 15, 2015 2:06 PM
To: Kopits, Elizabeth; Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Also, meant to say that even if people download the erratum and paper, they will likely see slightly different numbers from the RIA because we've made dollar year adjustments.

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 2:00 PM
To: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Right. Sorry forgot about the WP. Was thinking of Marten and Newbold.

Ex 5

From: Marten, Alex
Sent: Wednesday, July 15, 2015 1:37 PM
To: Kopits, Elizabeth; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Ex 5

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 1:32 PM
To: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Ex 5

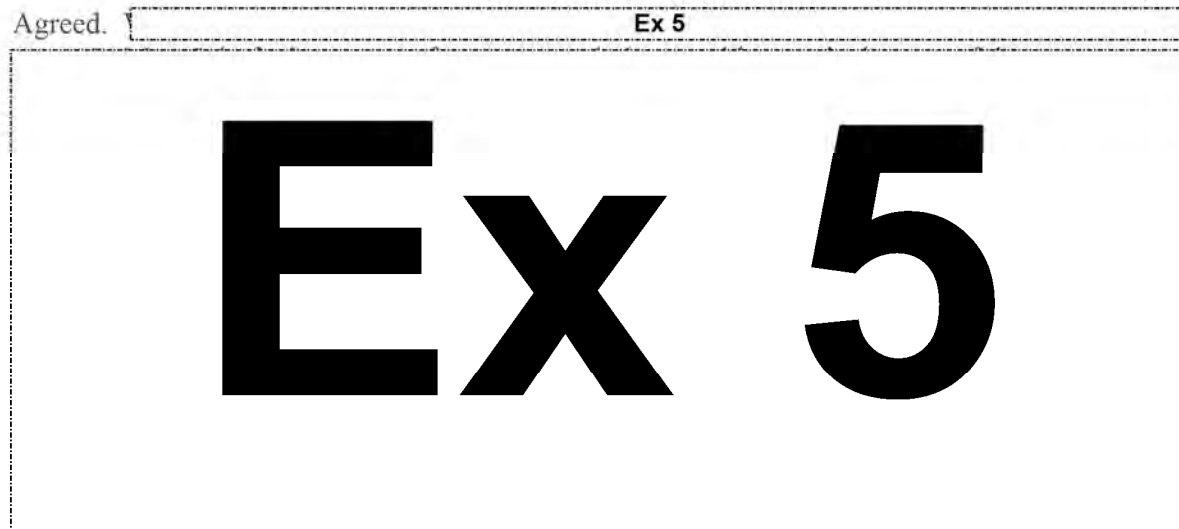
From: Marten, Alex
Sent: Wednesday, July 15, 2015 1:23 PM
To: Shouse, Kate; Kopits, Elizabeth
Subject: RE: question from Robin K for website for SCC info

This makes sense to me. I would change “paper” to “study” in the paragraph, but otherwise I think it’s probably the right length/info.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Shouse, Kate
Sent: Wednesday, July 15, 2015 9:07 AM
To: Kopits, Elizabeth
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info



From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 8:59 AM
To: Shouse, Kate
Cc: Marten, Alex

Subject: RE: question from Robin K for website for SCC info

Yes, I can put this on his radar again.

Ex 5

Ex 5

From: Shouse, Kate

Sent: Wednesday, July 15, 2015 8:42 AM

To: Kopits, Elizabeth

Cc: Marten, Alex

Subject: RE: question from Robin K for website for SCC info

Thanks and that's a good idea and easy enough to do.

Ex 5

Ex 5

Thanks,
Kate

From: Kopits, Elizabeth

Sent: Wednesday, July 15, 2015 8:36 AM

To: Shouse, Kate; Bowen, Jennifer; Kime, Robin

Cc: Marten, Alex

Subject: RE: question from Robin K for website for SCC info

Thanks, Kate. I think it looks good, and have just one comment.

If/when you can make any edits to it, think it would be nice to also embed a link to the main OMB SCC webpage (<https://www.whitehouse.gov/omb/oira/social-cost-of-carbon>) - maybe at the very end? Right now you have direct links to a few of the documents, but I think a link to the main page would be helpful too in case someone is interested in all versions of the TSD, earlier

blog post etc. And presumably, new developments will be added to this same page.

Thanks,

Elizabeth

From: Shouse, Kate
Sent: Wednesday, July 15, 2015 8:24 AM
To: Kopits, Elizabeth; Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex
Subject: RE: question from Robin K for website for SCC info

Hi, everyone. The updates to EPA's SCC website are now live – please see <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> and let me know if you have any questions (or see anything amiss). Thanks!

From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 4:05 PM
To: Bowen, Jennifer; Kime, Robin
Cc: Marten, Alex; Shouse, Kate
Subject: RE: question from Robin K for website for SCC info

Hi Jenny and Robin,

If you are looking for an EPA website on SCC, it is: <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html> . However, I don't think this has been updated yet to reflect the recent revision, etc. Kate Shouse (ccd above) might be able to tell you when we are likely to update it.

However, the 7/2 OMB blog post (<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>) provides the most recent info and includes links to the current TSD and response to public comments received through the recent OMB comment solicitation.

Hope this helps.

Thanks,

Elizabeth

From: Bowen, Jennifer
Sent: Thursday, July 09, 2015 3:57 PM
To: Kopits, Elizabeth; Marten, Alex
Cc: Kime, Robin
Subject: question from Robin K for website for SCC info

What is the best website to point folks to for more info re: SCC?

Thank you.

Jenny

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: McGartland, Al
Sent: Wed 7/15/2015 1:07:05 PM
Subject: Re: Social Cost of Carbon/Methane Update

I think I can make either time. All the conflicts are internal meetings that can be moved.

I don't think we need to involve Kevin. We can let them know it's scheduled. And if by chance I can't make it in fine with you doing this without me.

Sent from my iPhone

On Jul 15, 2015, at 7:42 AM, Kopits, Elizabeth <Kopits.Elizabeth@epa.gov> wrote:

Hi Al,

Ex 5

You currently have conflicts with both of time slots they have suggested below, but if you would like to join please let me know and I can suggest some other times to them.

Thanks,

Elizabeth

From: Michaud,Christian [NCR] [<mailto:Christian.Michaud@ec.gc.ca>]
Sent: Tuesday, July 14, 2015 4:12 PM
To: Kopits, Elizabeth
Subject: RE: Social Cost of Carbon/Methane Update

Hi Elizabeth,

Thank you very much for your quick response.

I hadn't seen the OMB blog on the update, but I have learned through other news outlets about the response to public comments, revisions to the TSD as well as the NAS peer-review process. I have reviewed the updated Technical Update paper and shared the information with my Chris and Warren, so we do have an understanding of what was changed in the methodology. With that said, I will review the post of the blog to ensure that I didn't miss anything on this.

As for timing of the call, it seems like all of us would be available on Wednesday the 22nd between 10 AM and 11 AM, and Thursday the 23rd between 1 PM and 2 PM. Would there be a half-hour time slot that would work for you at those times?

Best regards,

Christian Michaud

819-956-5146

From: Kopits, Elizabeth [<mailto:Kopits.Elizabeth@epa.gov>]

Sent: July 14, 2015 4:00 PM

To: Michaud, Christian [NCR]

Subject: Re: Social Cost of Carbon/Methane Update

Hi Christian,

Yes I would happy to talk any time. Next week either Wednesday or Thursday would be best. This week would be fine too.

In the meantime have you seen the 7/2 OMB blog post on SCC? It summarizes the latest developments and provides links to the new files.

Please feel free to suggest a couple of times that might work on your end. Looking forward to speaking soon.

Regards,

Elizabeth

Sent from my iPhone

On Jul 14, 2015, at 3:40 PM, "Michaud,Christian [NCR]" <Christian.Michaud@ec.gc.ca> wrote:

Hello Elizabeth,

My name is Christian Michaud from the Economic Analysis Directorate at Environment Canada. Previously, I worked under John Cuddihy, who was in touch with you about developments around the Social Cost of Carbon. As he left on an assignment recently, I've been asked to take over the lead on this file.

Recently, we have seen quite a few developments around the SCCO2 and SCCH4, and were wondering whether it would be possible for my new director, Warren Goodlet, my manager, Chris Adams, and myself to have a quick chat with you sometime next week in order to have a better understanding of what might be expected in the next few months on those files.

Please let me know if that would work for you.

Best regards,

Christian Michaud

Economist | Économiste

Economic Analysis Directorate | Direction de l'analyse économique

Strategic Policy Branch | Direction générale de la politique stratégique

Environment Canada | Environnement Canada

10, rue Wellington

Gatineau QC K1A 0H3

Christian.Michaud@ec.gc.ca

Telephone | Téléphone 819-956-5146

Facsimile | Télécopieur 819-953-3241

Government of Canada | Gouvernement du Canada

Website | Site Web www.ec.gc.ca

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Bowen, Jennifer
Sent: Wed 7/1/2015 7:11:21 PM
Subject: RE: help on write-up

Thank you! I know you are swamped today and appreciate that you pulled this together. I am sure we can finish it up next week.

Have a great long weekend! (Yes you are right about the "in-lieu of" holiday)

Jenny

566-2281

From: Kopits, Elizabeth
Sent: Wednesday, July 1, 2015 2:57 PM
To: Bowen, Jennifer
Subject: RE: help on write-up

Hi Jenny,

Sorry for the delay. Here is a start, but it is tricky to write - as you will see in my notes in the attached draft.

Please let me know if you would like to discuss. I am out tomorrow (since I assume that the in lieu of holiday is tomorrow for folks who are compressed on Friday?), but can be available to talk if needed. Also happy to help more on it next week.

Thanks again! I really appreciate the shout-out nomination! :)
Elizabeth

-----Original Message-----

From: Bowen, Jennifer
Sent: Wednesday, July 01, 2015 12:38 PM
To: Kopits, Elizabeth
Subject: Re: help on write-up

Perfect, thanks.

> On Jul 1, 2015, at 12:36 PM, Kopits, Elizabeth <Kopits.Elizabeth@epa.gov> wrote:

>

> Yes, it is on the top of my to do list. Will try to send along in the next hour or so.

>

> -----Original Message-----

> From: Bowen, Jennifer

> Sent: Wednesday, July 01, 2015 12:07 PM

> To: Kopits, Elizabeth

> Subject: RE: help on write-up

>

> Hi Elizabeth,

> Just a reminder if you have time to send this sometime today, that would be great. Thank you.

>
> Jenny
>
> 566-2281
>
>
>
>
> _____
> From: Bowen, Jennifer
> Sent: Thursday, June 25, 2015 5:28 PM
> To: Kopits, Elizabeth
> Subject: RE: help on write-up
>
> Next week by Wednesday (given the short week) would be great. Thank you!
>
> Jenny
>
> From: Kopits, Elizabeth
> Sent: Thursday, June 25, 2015 5:25 PM
> To: Bowen, Jennifer
> Subject: Re: help on write-up
>
> Ok sure, no problem. Is this for tomorrow or would early next week be ok? Thanks!
>
> Sent from my iPhone
>
> On Jun 25, 2015, at 4:54 PM, "Bowen, Jennifer"
> <Bowen.Jennifer@epa.gov<mailto:Bowen.Jennifer@epa.gov>> wrote:
> Hi Elizabeth,
>

Ex 5

>
> Thanks for your help - if there is something I might look at that would allow me to draft it, that would be fine, too.
>
> Jenny

To: Shouse, Kate[Shouse.Kate@epa.gov]; Fawcett, Allen[Fawcett.Allen@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Marten, Alex
Sent: Fri 5/15/2015 9:31:56 PM
Subject: Re: EPA's SCC website and SC-CH4 links
2015 05 15 oar scc website update (CH4 review options) v3 - alm.docx

I have mentioned this to both Joel and Alex before and received a shoulder shrug at best. I am under the working assumption that it meant they were OK with this approach, I know Al said he was fine with it.

I have a 1 or 2 small suggestions in the attached.

That is a good question about the paper. I know that we are never able to sign the copyright over to the journal since there was no copyright because we worked on it as government employees. But what that means for posting I don't know. I will look into it.

--

Alex Marten
marten.alex@epa.gov

From: Shouse, Kate
Sent: Friday, May 15, 2015 4:21 PM
To: Fawcett, Allen; Marten, Alex; Kopits, Elizabeth
Subject: EPA's SCC website and SC-CH4 links

Hi, all. We discussed updating EPA/OAR's SCC website to provide links to the peer review of the Marten et al application. This would be a much easier way for people to obtain copies of the peer reviews (rather than the Science Inventory). Allen, Alex M, Al, and I discussed this in person but I don't recall whether Alex B was in the room. Al seemed to think it was fine.

The attached Word file shows the text of the current SCC website and the redline is my suggested language for the update. Please let me know what you think about the content and also any views on timing

Ex 5

Ex 5

It should not take long for the contractor to make the update but I think worthwhile to have this ready soon.

Thanks
Kate

To: Fawcett, Allen[Fawcett.Allen@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Shouse, Kate
Sent: Fri 5/15/2015 8:21:04 PM
Subject: EPA's SCC website and SC-CH4 links
website update (CH4 review options) v3.docx

Hi, all.

Ex 5

Ex 5

Ex 5

Ex 5 It should not take long for the contractor to make the update but I think worthwhile to have this ready soon.

Thanks
Kate

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Shouse, Kate
Sent: Fri 1/23/2015 5:39:52 PM
Subject: Re: recap of SCC/SCM to do list

Thanks! You've done a lot this week and appreciate you going the extra mile to draft these documents and comment on the many others on EPA's plate. Hope that you have some time to catch your breath and rest before the baby arrives. Will be thinking of you and hoping for a safe and healthy delivery (and a baby that likes to sleep a lot). Good luck and please send along photos!

From: Kopits, Elizabeth
Sent: Thursday, January 22, 2015 4:13 PM
To: Marten, Alex; Shouse, Kate
Cc: McGartland, Al; Barron, Alex
Subject: RE: recap of SCC/SCM to do list

Hi Alex and Kate,

Here are my notes/thoughts on the key points that should be made as a lead in/intro to the draft charge at the Feb 12th meeting. There's nothing particularly novel here, but hopefully it will serve as a helpful start.

I have to leave soon but can talk anytime tomorrow morning by phone – about our collective comments on the RTC draft or these notes for the Feb 12 meeting. I haven't made any progress on the SCM response or the Q&A on NAS, but I will see what thoughts I can still pull together on those tomorrow. I'm so sorry I haven't been able to do more this week.

Best,

Elizabeth

From:

.

On Jan 21, 2015, at 1:27 PM, "Kopits, Elizabeth" <Kopits.Elizabeth@epa.gov> wrote:

Hi Alex and Kate,

Per my discussion with Alex B, here is a recap of our immediate SCC/SCM to do list. Please let me know if I am forgetting something. I will do what I can to send you both my thoughts on #1-3 before the end of the week. And happy to discuss #4 when you are ready.

Need to draft:

Ex 5

Also, attached is my draft timeline that Alex B asked for. He said bullet form was fine so I didn't spend much time trying to think of a prettier format, but if you have an idea for alternative (simple!) presentation formats, please let me know. And please let me know if I am forgetting anything. I'd like to send this to him later today or tomorrow morning if possible.

Thanks!

Elizabeth

<draft SCC,SCM work timeline.docx>

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: McGartland, Al
Sent: Tue 1/13/2015 3:59:21 PM
Subject: RE: SCC - NAS draft charge

We have a biweekly – Let's send an email to Joel now and close on it at the biweekly. OK. Can you send?

From: Kopits, Elizabeth
Sent: Tuesday, January 13, 2015 10:57 AM
To: McGartland, Al
Cc: Marten, Alex
Subject: FW: SCC - NAS draft charge

Hi Al –

Kate is asking whether there is an SCC meeting this week (see below). This leads me to think that no one from OAR has been added to the Friday invite. Should we ask Joel about this, or just directly ask CEA to add them (e.g., Allen and/or Paul)?

Thanks,

Elizabeth

From: Shouse, Kate
Sent: Tuesday, January 13, 2015 10:45 AM
To: Kopits, Elizabeth
Subject: FW: SCC - NAS draft charge

Hi, Elizabeth. Just wanted to check in and see whether any meetings have been scheduled for this week (sounded like that was goal). I'm on a full-time schedule now, working M-F, with telework days TBD.

Thanks for checking back with Andy and Jonathan. Hope you're doing well in the final stretch. And please share photos whenever the baby arrives!

From: Beauvais, Joel
Sent: Wednesday, January 07, 2015 11:18 AM
To: Kopits, Elizabeth; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: RE: SCC - NAS draft charge

Thanks, Elizabeth and company. This looks good to me. I flagged for Joe as well.

Ex 5

Ex 5

Joel

From: Kopits, Elizabeth
Sent: Wednesday, January 07, 2015 10:59 AM
To: Beauvais, Joel; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: SCC - NAS draft charge

Hi Joel and Al,

Attached is the revised NAS draft charge, reflecting the edits we discussed yesterday – and NCEE-CEB staff feedback on those edits. I just spoke to Allen and he is sending this version up their chain for Joe and Janet's feedback.

Please let me know if you would like to discuss and/or have any other edits.

Thanks,

Elizabeth

To: Gunning, Paul[Gunning.Paul@epa.gov]; Beauvais, Joel[Beauvais.Joel@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Cc: Newbold, Steve[Newbold.Steve@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Li, Jia[Li.Jia@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Fawcett, Allen[Fawcett.Allen@epa.gov]; DeMocker, Jim[DeMocker.Jim@epa.gov]
From: McGartland, Al
Sent: Fri 1/9/2015 2:57:22 PM
Subject: RE: SCC - NAS draft charge

Woo Hoo! Thanks to everyone on the SCC team.

Ex 5

From: Gunning, Paul
Sent: Friday, January 09, 2015 9:54 AM
To: Beauvais, Joel; Kopits, Elizabeth; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim
Subject: RE: SCC - NAS draft charge

Joel – just got confirmation that both Joe and Janet are fine with this. Good to go from our end.

Paul

From: Beauvais, Joel
Sent: Wednesday, January 07, 2015 11:18 AM
To: Kopits, Elizabeth; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: RE: SCC - NAS draft charge

Thanks, Elizabeth and company. This looks good to me. I flagged for Joe as well.

Ex 5

Ex 5

Joel

From: Kopits, Elizabeth
Sent: Wednesday, January 07, 2015 10:59 AM
To: Beauvais, Joel; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: SCC - NAS draft charge

Hi Joel and Al,

Attached is the revised NAS draft charge, reflecting the edits we discussed yesterday – and NCEE-CEB staff feedback on those edits. I just spoke to Allen and he is sending this version up their chain for Joe and Janet's feedback.

Please let me know if you would like to discuss and/or have any other edits.

Thanks,

Elizabeth

To: Shouse, Kate[Shouse.Kate@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Kopits, Elizabeth
Sent: Mon 6/29/2015 5:17:36 PM
Subject: RE: scc comment citing 1981 court decision
[Comment#131_Rubber Manufacturers Assn.pdf](#)

Got it. They were the ones citing **Ex 5** – see p. 3

From: Kopits, Elizabeth
Sent: Monday, June 29, 2015 1:14 PM
To: Shouse, Kate
Cc: Marten, Alex
Subject: scc comment citing 1981 court decision

I think it is from the Rubber Manufacturers Assoc. (comment #131). Kate –do you happen to have this one? If not, I am downloading it from regulations.gov now.

To: Shouse, Kate[Shouse.Kate@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Kopits, Elizabeth
Sent: Wed 5/27/2015 2:13:12 PM
Subject: RE: HD GHG Phase 2 Preamble Section 9 for SCC update

Ex 5

Ex 5

I will let

him know that you need to add language by 4pm.

From: Shouse, Kate
Sent: Wednesday, May 27, 2015 10:11 AM
To: Kopits, Elizabeth
Cc: Marten, Alex
Subject: RE: HD GHG Phase 2 Preamble Section 9 for SCC update

Hi – Just wanted to check in on the status of the HD2 language. Do you know whether Alex B has had a chance to review? Want to make sure OTAQ has a chance to review; they are compiling the preamble tomorrow morning, so that means I need to add the language to the shared drive by 4 pm today.

Also,

Ex 5

From: Kopits, Elizabeth
Sent: Tuesday, May 26, 2015 2:56 PM
To: Shouse, Kate
Cc: Marten, Alex
Subject: RE: HD GHG Phase 2 Preamble Section 9 for SCC update

Yeah, I think that is a good plan. I am thinking a footnote right after footnote 74 along the lines of:

OMB also responded in January 2014 to concerns submitted in a Request for Correction on the SCC TSDs. OMB's 1/24/14 response to the petition is available at <https://www.whitehouse.gov/sites/default/files/omb/inforeg/ssc-rfc-under-iqa-response.pdf>.

What do you think?

E.

From: Shouse, Kate
Sent: Tuesday, May 26, 2015 2:46 PM
To: Kopits, Elizabeth
Cc: Marten, Alex
Subject: Re: HD GHG Phase 2 Preamble Section 9 for SCC update

Steve Silverman in OGC asked me to add the reference to the petition in that section. I was debating between including it in the text and in the footnote; either way will need to circle back with him. Perhaps we can add it back in after Alex B reviews and send to Steve S?

From: Kopits, Elizabeth
Sent: Tuesday, May 26, 2015 2:42 PM
To: Shouse, Kate
Cc: Marten, Alex
Subject: RE: HD GHG Phase 2 Preamble Section 9 for SCC update

Yes, I fixed that. But as you will see in what I sent Alex B, I ended up dropping the mention of the petition response. We can easily add it back in if you think it's important to mention it (maybe in a footnote?), but otherwise I think it might be easiest to just drop it to avoid any confusion.

From: Shouse, Kate
Sent: Tuesday, May 26, 2015 2:39 PM
To: Kopits, Elizabeth
Cc: Marten, Alex
Subject: Re: HD GHG Phase 2 Preamble Section 9 for SCC update

Does this version include edits from Alex Marten? I'm working on those right now because I think they inadvertently changed the meaning about the OMB response to the IQA petition (OMB issued a response to the petition in Jan 2014; it was a separate process from the RTC).

From: Kopits, Elizabeth
Sent: Tuesday, May 26, 2015 2:37 PM
To: Barron, Alex
Cc: Shouse, Kate; Marten, Alex; McGartland, Al
Subject: RE: HD GHG Phase 2 Preamble Section 9 for SCC update

Hi Alex B,

Attached are our suggested edits for the HD2 Preamble. We can do something similar for the RIA, but I am still waiting for the current version of that document.

The additional paragraphs are near the bottom of p. 45 through the top of p. 46. (Tracked changes elsewhere in the document are earlier edits made by Kate and others.) I also added a footnote to all tables containing climate benefits (Tables IX-11-18 and Tables IX-32-35).

Let me know what you think. We have not sent it back to OTAQ yet.

Thanks,

Elizabeth

From: Yanca, Catherine
Sent: Tuesday, May 26, 2015 11:25 AM
To: Shouse, Kate; Kopits, Elizabeth
Subject: HD GHG Phase 2 Preamble Section 9 for SCC update

Here's the latest version of the preamble section on costs, benefits, etc for the additional text on SCC.

To: Shouse, Kate[Shouse.Kate@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 1/13/2015 6:13:00 PM
Subject: RE: SCC - NAS draft charge

Sure, I have no idea if there is a space constraint but you all should feel free to go ahead and ask CEA to add you. I think Jeff Goldstein ([REDACTED] **EOP email/phone**) is the one who set up the meeting.

From: Shouse, Kate
Sent: Tuesday, January 13, 2015 12:59 PM
To: Kopits, Elizabeth
Subject: RE: SCC - NAS draft charge

Sorry, one more question – are you able to ask CEA to add my name to the meeting invite? Just checked in with Allen and if there's room, I'd like to join. If we should ask someone else, just let me know who. Thanks!

From: Kopits, Elizabeth
Sent: Tuesday, January 13, 2015 12:42 PM
To: Shouse, Kate
Subject: RE: SCC - NAS draft charge

Hi Kate,

Thanks for checking in. The meeting with EOP is scheduled for this Friday, 12-1pm. I just wrote to CEA to make sure that both Paul and Allen are on the invite – I didn't handle the logistics so I can't tell if they had already been added or not.

Per Joel's direction, after we got the OK from OAR, I sent the draft NAS charge over to Josh and Jim last Friday. I will forward to you in a sec for your records. I have not heard any feedback from them since then, but I will give Josh a ring soon to see what they think so far. Will keep

you updated.

And congrats on coming back to FT! Unless the baby decides otherwise, I should still be around through next Friday (1/23), so we will definitely still chat before then. ☺

Best,

Elizabeth

From: Shouse, Kate
Sent: Tuesday, January 13, 2015 10:45 AM
To: Kopits, Elizabeth
Subject: FW: SCC - NAS draft charge

Hi, Elizabeth. Just wanted to check in and see whether any meetings have been scheduled for this week (sounded like that was goal). I'm on a full-time schedule now, working M-F, with telework days TBD.

Thanks for checking back with Andy and Jonathan. Hope you're doing well in the final stretch. And please share photos whenever the baby arrives!

From: Beauvais, Joel
Sent: Wednesday, January 07, 2015 11:18 AM
To: Kopits, Elizabeth; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: RE: SCC - NAS draft charge

Thanks, Elizabeth and company. This looks good to me.

Ex 5

Ex 5

Ex 5

Joel

From: Kopits, Elizabeth

Sent: Wednesday, January 07, 2015 10:59 AM

To: Beauvais, Joel; McGartland, Al

Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul

Subject: SCC - NAS draft charge

Hi Joel and Al,

Attached is the revised NAS draft charge, reflecting the edits we discussed yesterday – and NCEE-CEB staff feedback on those edits. I just spoke to Allen and he is sending this version up their chain for Joe and Janet's feedback.

Please let me know if you would like to discuss and/or have any other edits.

Thanks,

Elizabeth

To: Beauvais, Joel[Beauvais.Joel@epa.gov]
Cc: McGartland, Al[McGartland.Al@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 1/13/2015 4:14:15 PM
Subject: FW: SCC - NAS draft charge

Hi Joel,

Sorry to bother you with this, but I just got an email from Kate Shouse in OAP asking whether there is an SCC meeting this week (below). This leads me to think that no one from OAR knows about the Friday meeting. Did you want to add anyone from OAP (e.g., Allen and/or Paul)? If so, would you like me to take care of it?

Elizabeth

From: Shouse, Kate
Sent: Tuesday, January 13, 2015 10:45 AM
To: Kopits, Elizabeth
Subject: FW: SCC - NAS draft charge

Hi, Elizabeth. Just wanted to check in and see whether any meetings have been scheduled for this week (sounded like that was goal). I'm on a full-time schedule now, working M-F, with telework days TBD.

Thanks for checking back with Andy and Jonathan. Hope you're doing well in the final stretch. And please share photos whenever the baby arrives!

From: Beauvais, Joel
Sent: Wednesday, January 07, 2015 11:18 AM
To: Kopits, Elizabeth; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: RE: SCC - NAS draft charge

Thanks, Elizabeth and company. This looks good to me.

Ex 5

Ex 5

Joel

From: Kopits, Elizabeth

Sent: Wednesday, January 07, 2015 10:59 AM

To: Beauvais, Joel; McGartland, Al

Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul

Subject: SCC - NAS draft charge

Hi Joel and Al,

Attached is the revised NAS draft charge, reflecting the edits we discussed yesterday – and NCEE-CEB staff feedback on those edits. I just spoke to Allen and he is sending this version up their chain for Joe and Janet's feedback.

Please let me know if you would like to discuss and/or have any other edits.

Thanks,

Elizabeth

To: McGartland, Al[McGartland.Al@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 1/13/2015 3:59:50 PM
Subject: RE: SCC - NAS draft charge

Yes, will do. Thanks!

From: McGartland, Al
Sent: Tuesday, January 13, 2015 10:59 AM
To: Kopits, Elizabeth
Cc: Marten, Alex
Subject: RE: SCC - NAS draft charge

We have a biweekly – Let's send an email to Joel now and close on it at the biweekly. OK. Can you send?

From: Kopits, Elizabeth
Sent: Tuesday, January 13, 2015 10:57 AM
To: McGartland, Al
Cc: Marten, Alex
Subject: FW: SCC - NAS draft charge

Hi Al –

Kate is asking whether there is an SCC meeting this week (see below). This leads me to think that no one from OAR has been added to the Friday invite. Should we ask Joel about this, or just directly ask CEA to add them (e.g., Allen and/or Paul)?

Thanks,

Elizabeth

From: Shouse, Kate
Sent: Tuesday, January 13, 2015 10:45 AM
To: Kopits, Elizabeth
Subject: FW: SCC - NAS draft charge

Hi, Elizabeth. Just wanted to check in and see whether any meetings have been scheduled for this week (sounded like that was goal). I'm on a full-time schedule now, working M-F, with telework days TBD.

Thanks for checking back with Andy and Jonathan. Hope you're doing well in the final stretch. And please share photos whenever the baby arrives!

From: Beauvais, Joel
Sent: Wednesday, January 07, 2015 11:18 AM
To: Kopits, Elizabeth; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: RE: SCC - NAS draft charge

Thanks, Elizabeth and company. This looks good to me.

Ex 5

Ex 5

Joel

From: Kopits, Elizabeth
Sent: Wednesday, January 07, 2015 10:59 AM
To: Beauvais, Joel; McGartland, Al
Cc: Newbold, Steve; Griffiths, Charles; Marten, Alex; Wolverton, Ann; Li, Jia; Shouse, Kate; Fawcett, Allen; DeMocker, Jim; Gunning, Paul
Subject: SCC - NAS draft charge

Hi Joel and Al,

Attached is the revised NAS draft charge, reflecting the edits we discussed yesterday – and NCEE-CEB staff feedback on those edits. I just spoke to Allen and he is sending this version up their chain for Joe and Janet's feedback.

Please let me know if you would like to discuss and/or have any other edits.

Thanks,

Elizabeth

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; ekopits@gmail.com[ekopits@gmail.com]
From: Kopits, Elizabeth
Sent: Tue 1/6/2015 3:02:00 PM
Subject: Fwd: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN
2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN_ek alm ks.docx
ATT00001.htm

Sent from my iPhone

Begin forwarded message:

From: "Shouse, Kate" <Shouse.Kate@epa.gov>
Date: January 6, 2015 at 9:47:31 AM EST
To: "Marten, Alex" <Marten.Alex@epa.gov>, "Kopits, Elizabeth" <Kopits.Elizabeth@epa.gov>, "Newbold, Steve" <Newbold.Steve@epa.gov>, "Griffiths, Charles" <Griffiths.Charles@epa.gov>, "Wolverton, Ann" <Wolverton.Ann@epa.gov>, "Li, Jia" <Li.Jia@epa.gov>
Cc: "McGartland, Al" <McGartland.Al@epa.gov>, "Fawcett, Allen" <Fawcett.Allen@epa.gov>
Subject: RE: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN

I added my two cents to the comments

Ex 5

Thanks,

Kate

From: Marten, Alex
Sent: Tuesday, January 06, 2015 9:05 AM
To: Kopits, Elizabeth; Newbold, Steve; Griffiths, Charles; Wolverton, Ann; Shouse, Kate; Li, Jia
Cc: McGartland, Al; Fawcett, Allen
Subject: RE: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN

Ex 5

Ex 5 I have included my thoughts in the attached, where I have not said anything it's because I agree w/ the change.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Kopits, Elizabeth
Sent: Tuesday, January 06, 2015 5:45 AM
To: Marten, Alex; Newbold, Steve; Griffiths, Charles; Wolverton, Ann; Shouse, Kate; Li, Jia
Cc: McGartland, Al; Fawcett, Allen
Subject: Fwd: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN

Hi All-

Attached are some minor initial comments from Joel on the charge questions and my reactions to them. Please let me know if you have any additional thoughts.

I will be teleworking for the next few hours but should be in the office by mid morning.

Thanks,

Elizabeth

From: "Beauvais, Joel" <Beauvais.Joel@epa.gov>
Date: January 5, 2015 at 5:37:21 PM EST
To: "Kopits, Elizabeth" <Kopits.Elizabeth@epa.gov>, "McGartland, Al" <McGartland.Al@epa.gov>
Cc: "Beauvais, Joel" <Beauvais.Joel@epa.gov>
Subject: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN

Elizabeth – Some minor comments and questions for our discussion
tomorrow. I will look forward to talking through

Ex 5

Ex 5

Joel

To: Shouse, Kate[Shouse.Kate@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 1/6/2015 3:01:38 PM
Subject: Re: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN

Thanks. I am still at home. At this point I will likely drive in only for the 1pm meeting.

On Jan 6, 2015, at 9:51 AM, "Shouse, Kate" <Shouse.Kate@epa.gov> wrote:

Careful if you come to the office – sidewalks are still pretty slippery, fyi.

From: Kopits, Elizabeth
Sent: Tuesday, January 06, 2015 5:45 AM
To: Marten, Alex; Newbold, Steve; Griffiths, Charles; Wolverton, Ann; Shouse, Kate; Li, Jia
Cc: McGartland, Al; Fawcett, Allen
Subject: Fwd: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN

Hi All-

Attached are some minor initial comments from Joel on the charge questions and my reactions to them. Please let me know if you have any additional thoughts.

I will be teleworking for the next few hours but should be in the office by mid morning.

Thanks,

Elizabeth

From: "Beauvais, Joel" <Beauvais.Joel@epa.gov>
Date: January 5, 2015 at 5:37:21 PM EST
To: "Kopits, Elizabeth" <Kopits.Elizabeth@epa.gov>, "McGartland, Al" <McGartland.Al@epa.gov>
Cc: "Beauvais, Joel" <Beauvais.Joel@epa.gov>
Subject: 2015 01 05 NAS SCC draft charge questions_STAFFfinal_CLEAN

Elizabeth – Some minor comments and questions for our discussion tomorrow. I will look forward to talking through

Ex 5

Ex 5

Joel

To: Marten, Alex[Marten.Alex@epa.gov]
Cc: Shouse, Kate[Shouse.Kate@epa.gov]
From: Li, Jia
Sent: Mon 2/9/2015 11:23:16 PM
Subject: RE: questions on rtc document
2015 02 07 SCC RTC Clean for Interagency Review jl.docx

Alex:

Thanks! This is really helpful background.

I will keep thinking about a better definition to replace “climate economic impact modeling” but may not be communication savvy enough to be successful.

On the changes to the first two pages: I am sending you my current comments and edits. I have removed other comments but have a few that I’d be interested in your input on whether these changes are worth making.

Jia

From: Marten, Alex
Sent: Monday, February 09, 2015 6:09 PM
To: Li, Jia
Cc: Shouse, Kate
Subject: RE: questions on rtc document

Hi Jai,

I am going to take your questions in stages.

- This language on climate economic impact models is incredibly tortured in my opinion and I'm not a big fan of it. Comms folks really seem to hate the term "integrated assessment models" as it comes off as too jargony in their opinion so they are always trying to get rid of it or add in something like "climate economic impact modeling." The agency has already used this language in various letters to the hill and elsewhere so I just used that here. If you have another suggestion that can thread that needle I would be happy to hear it.

- Yes this current version should be considered nearly final being reviewed for technical accuracy. I would suggest that inconsistencies fall into this category and we would really want to know about them. The background on the first two pages and the "introduction" section should be considered the most set, as the current version has undergone management review already. I think any notable changes there would need to be pretty compelling.

Sorry for any confusion.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Li, Jia
Sent: Monday, February 09, 2015 5:53 PM
To: Marten, Alex
Cc: Shouse, Kate
Subject: questions on rtc document

Hi Alex:

I am currently reviewing the RtC and have a couple of questions. I remember you added the

following language to describe the IAMs:

Ex 5

Ex 5

I also just saw your email regarding the guidance for review. I have made a significant number of comments on the first two pages, as I found the language is vague in some cases and in consistent with the rest of the document in other cases. Should I refrain myself from extensive comments, or provide you with my comments for your consideration?

Many thanks!

Jia

To: McGartland, Al[McGartland.Al@epa.gov]; Fawcett, Allen[Fawcett.Allen@epa.gov]
Cc: Newbold, Steve[Newbold.Steve@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Germann, Sandy[Germann.Sandy@epa.gov]; Niebling, William[Niebling.William@epa.gov]; Millett, John[Millett.John@epa.gov]
From: Shouse, Kate
Sent: Thur 4/2/2015 3:19:27 PM
Subject: RE: draft interview questions on SCC

Hi, Al. Allen and I reviewed the questions and do not have any concerns or additions. I also

Ex 5

Also, I think there's an internal question embedded in the response to the second question (see last sentence in EPA's response, "Can we point out that...")

Thanks,
Kate

From: McGartland, Al
Sent: Tuesday, March 31, 2015 9:56 AM
To: Fawcett, Allen; Shouse, Kate
Cc: Newbold, Steve; Marten, Alex; Germann, Sandy; Niebling, William; Millett, John
Subject: draft interview questions on SCC

Hi. A student working on his thesis (I think in political science) sent us the following questions on SCC. These are heavily weighted towards process stuff (not technical). Rather than say we didn't want to answer, we drafted these limited responses. Could you all concur/edit these? Once we agree on a final draft we can shoot a copy to OMB/CEA and then send it off. The student is at Univ. of Penn.

To: Marten, Alex[Marten.Alex@epa.gov]
From: Newbold, Steve
Sent: Tue 3/17/2015 11:22:49 AM
Subject: FW: fyi - letter re social cost of carbon

Let me know if I can help with any more edits to the RTC at this point. I can carve out time to sit down with you or to look at any troublesome sections on my own.

Steve Newbold
U.S. EPA
National Center for Environmental Economics (NCEE)
EPA West, 4316T, MC 1809T
1200 Pennsylvania Ave NW
Washington, DC 20004
(202) 566-2293

From: McGartland, Al
Sent: Monday, March 16, 2015 5:31 PM
To: Barron, Alex; Marten, Alex; Newbold, Steve; Griffiths, Charles; Roberts, Martha; Beauvais, Joel
Subject: FW: fyi - letter re social cost of carbon

Ex 5

From: Wolfson, Steve
Sent: Monday, March 16, 2015 9:50 AM
To: McGartland, Al; Zenick, Elliott
Subject: fyi - letter re social cost of carbon

Fyi –

Senate Republicans Write Letter Questioning Social Cost of Carbon

On March 9, 11 Republican Senators led by Environment and Public Works Committee Chairman Jim Inhofe (R-OK), addressed a letter to the White House Office of Information and Regulatory Affairs (OIRA) to express concern over the White House estimated social cost of carbon emissions. Currently valued at \$37 per ton, the administration uses the social cost of carbon when calculating the cost-benefit analysis of regulations that reduce greenhouse gas emissions. The OIRA did not have a public comment period on the carbon accounting methodology, but in November of 2013 decided to allow input. The Senators said, “While we continue to have significant concerns over the process establishing and the substance underlying the [social cost of carbon], public information on the estimates is paramount given its increasing application to federal—and state—programs,” they asked OIRA to respond to their concerns by March 30, 2015.

For more information see:

[The Hill, Letter](#)

Steve Wolfson

US Environmental Protection Agency

Office of General Counsel – International Law Group

WJC North, Room 7506C

202 564-5411

To: McGartland, Al[McGartland.Al@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Newbold, Steve
Sent: Sun 2/8/2015 4:17:00 PM
Subject: Re: anyone want to speak on SCC April 23 in Minnesota?

That sounds fine to me. Shall we touch base tomorrow morning before we decide on a final course of action?

Steve Newbold
U.S. EPA
National Center for Environmental Economics (NCEE)
EPA West, 4316T, MC 1809T
1200 Pennsylvania Ave NW
Washington, DC 20004
(202) 566-2293

From: McGartland, Al
Sent: Sunday, February 08, 2015 9:11 AM
To: Newbold, Steve
Cc: Marten, Alex; Griffiths, Charles; Wolverton, Ann
Subject: Re: anyone want to speak on SCC April 23 in Minnesota?

Great. I'm going to speak to the guy on Monday. I'm on the agenda at some other workshops and feeling a little overexposed.

Ex 5

Sent from my iPhone

On Feb 8, 2015, at 7:27 AM, Newbold, Steve <Newbold.Steve@epa.gov> wrote:

Barring any pre-existing family commitments I would be happy to do this if no one else is eager to go. I will be giving a presentation on the SCC in New Haven at the end of this month, so I will have already prepared remarks on this topic. But I'm also happy to hand off my slides if someone else would like a turn.

Steve Newbold
U.S. EPA

National Center for Environmental Economics (NCEE)
EPA West, 4316T, MC 1809T
1200 Pennsylvania Ave NW
Washington, DC 20004
(202) 566-2293

From: McGartland, Al
Sent: Friday, February 06, 2015 5:11 PM
To: Newbold, Steve; Marten, Alex; Griffiths, Charles; Wolverton, Ann
Subject: anyone want to speak on SCC April 23 in Minnesota?

I think the talk is to at a law conference. I will know more early next week.

To: Shouse, Kate[Shouse.Kate@epa.gov]
Bcc: alex.marten.work@gmail.com[alex.marten.work@gmail.com]
From: Marten, Alex
Sent: Mon 3/16/2015 5:16:19 PM
Subject: missing q's

Ex 5

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

To: Griffiths, Charles[Griffiths.Charles@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Heninger, Brian
Sent: Thur 5/7/2015 5:16:02 PM
Subject: RE: Meeting on May 20?

Charles,

So, Are you up for this meeting then? If so, Matt suggests 3 or 3:30 (see e-mail copied below.)

For scheduling purposes: Yes/No, what time? Do you want me to reply or you?

-Brian

From: Ex 4
Sent: Thursday, May 07, 2015 12:46 PM
To: Heninger, Brian
Subject: RE: Meeting on May 20?

Hi Brian,

Thanks! My schedule is still a little in flux, but it looks like 3pm or 3:30pm on May 20 would work best (for either a half hour or hour meeting). Obviously, this depends on whether you and the team would be ready to meet by then.

Thanks,

Matt

Ex 4

Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Kopits, Elizabeth
Sent: Wednesday, May 06, 2015 1:02 PM
To: Griffiths, Charles; Marten, Alex; Heninger, Brian
Subject: RE: Meeting on May 20?

Thanks, Charles. As we just discussed, I would be happy to join the meeting on the 20th, and will try but can't promise to have comments on the report by then.

Thanks!

E.

From: Griffiths, Charles
Sent: Wednesday, May 06, 2015 12:41 PM
To: Marten, Alex; Heninger, Brian
Cc: Kopits, Elizabeth
Subject: RE: Meeting on May 20?

I can probably have comments by the 20th. Elizabeth, did you want to jump back into this or should I just brief you guys before I talk to Matt?

Charles

From: Marten, Alex
Sent: Tuesday, May 05, 2015 5:00 PM
To: Heninger, Brian; Griffiths, Charles

Cc: Kopits, Elizabeth
Subject: RE: Meeting on May 20?

I can pretty much guarantee I will not have read the report by the 20th and its highly unlikely I will be able to spend any serious time w/ it until June. So I will leave this up to the others.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Heninger, Brian
Sent: Tuesday, May 05, 2015 4:17 PM
To: Griffiths, Charles; Marten, Alex
Cc: Kopits, Elizabeth
Subject: FW: Meeting on May 20?

Hi Charles, Alex and Elizabeth?

Matt will be in town on May 20th (see below.) We can have a no cost meeting with him on finalizing this project/work assignment if we are ready to talk by then. Let me know if this sounds like a desirable thing to do (for even just one of you, or any many as interested.)

- Brian

From: Ex 4
Sent: Tuesday, May 05, 2015 4:09 PM
To: Heninger, Brian
Subject: Meeting on May 20?

Hi Brian,

Quick question for you. I'll be in D.C. in two weeks to give a presentation at the Society of Government Economists conference. Do you think you and the SCC team will have completed your review of the extreme weather report by then? Since I'm flying to D.C. the day before the conference, it would be a good opportunity to meet in person to go over your comments and plan next steps on wrapping up this project.

Right now I'm free at 11am, 3pm, or 4pm on May 20. Let me know if any of those times might work.

Thanks,

Matt

Ex 4

Associate | **Abt Associates**

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: **Ex 4**

Sent: Monday, May 04, 2015 12:36 PM

To: 'Heninger, Brian'

Subject: RE: SCC update

Hi Brian,

Sure, that sounds good. Let me know when you're ready to talk.

Thanks,

Matt

Ex 4

Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Heninger, Brian [<mailto:Heninger.Brian@epa.gov>]

Sent: Monday, May 04, 2015 11:49 AM

To: **Ex 4**

Cc: Griffiths, Charles; Marten, Alex; Lisa Tarquinio; Audrey Lew; Kopits, Elizabeth

Subject: RE: SCC update

Hi Matt,

Thanks for the note and also the new draft on Extreme Weather. We are currently reviewing the

Ex 4

Thanks, -Brian

Brian Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

From: Ex 4 Ex 4
Sent: Friday, May 01, 2015 9:18 PM
To: Heninger, Brian
Cc: Griffiths, Charles; Marten, Alex; Lisa Tarquinio; Audrey Lew
Subject: RE: SCC update

Hi Brian,

I'm pleased to send you a near-complete draft of the extreme weather report. I've added some notes for you in a couple of places, but except for that it's a clean copy. As I mentioned in my previous email, I think the report is at a point where it would be good for you and the NCEE SCC team to review carefully.

We'll plan to hold off on any further work until we hear back from you. Please let me know if you would like to set up a meeting in the next couple of weeks, either as a prelude to your review, or once you have comments.

Lisa and Audrey and I will look forward to your thoughts and suggestions about the document.

Thanks,

Matt

Ex 4

Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Ex 4
Sent: Wednesday, April 29, 2015 10:33 AM
To: Brian Heninger <Heninger.Brian@epa.gov>
Cc: Griffiths, Charles (Griffiths.Charles@epa.gov); Alex Marten (Marten.Alex@epa.gov)
Subject: SCC update

Hi Brian,

Ex 4

Ex 4

Also, It's been a while since we've talked, so I just wanted to send you a quick status update as well.

I'm planning to send you a complete, clean draft of the SCC report by Monday morning. It has come a long way since the last version, in terms of coverage of analytical and empirical topics in the literature. It has also gotten quite long--I think it's about 90 pages right now. However, we've tried hard to smooth out the writing, and have moved a lot of material into appendices.

Overall, I think it's turned into a pretty good report. I think a useful next step would be for you and the SCC team to review the document carefully, and let us know what further comments and suggestions you have. Since we are getting towards the end of this work assignment--I'm

Ex 4

Ex 5

Ex 5

Thanks,

Matt

Ex 4

Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Cc: Newbold, Steve[Newbold.Steve@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]
From: Heninger, Brian
Sent: Mon 2/9/2015 4:24:34 PM
Subject: FW: Working draft of extreme weather report
Extreme Weather Lit Review Draft - 2015-02-09.docx

Abt's latest version of Extreme Weather Piece – sent during a snow storm (-:

I suggest, we can look it over briefly just to see if you have any thoughts on what they are doing, and unless there is anything major worth discussing, we can skip talking tomorrow. But, let me know, if you have an opinion, because if you want to discuss anything, and Abt is not snowed in, then that's fine to keep our 10am discussion – **Charles**, I am mainly talking to you.

Thanks, -Brian

From: Matthew Ranson [mailto:Matthew_Ranson@abtassoc.com]
Sent: Monday, February 09, 2015 11:12 AM
To: Heninger, Brian
Subject: SCC: Working draft of extreme weather report

Hi Brian,

I'm attaching our current working draft of the extreme weather report. Relative to the draft I

Ex 5

Ex 5

There is a lot of material here, and we're making good progress, but it's still very much a messy half-written document. So, while we would certainly welcome your comments and suggestions, it would probably be most productive for you to focus your review on high-level items.

Our office is closed today due to heavy snow. I'm assuming that we're planning to talk tomorrow at 10, but if we have a snow delay tomorrow, I'll email you by 9am so we can reschedule our call. And if you would prefer to wait another two weeks before you assemble the full team for a meeting, that would be fine too.

To: Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Cc: Newbold, Steve[Newbold.Steve@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]
From: Heninger, Brian
Sent: Mon 2/9/2015 4:24:34 PM
Subject: FW: Working draft of extreme weather report
Extreme Weather Lit Review Draft - 2015-02-09.docx

Abt's latest version of Extreme Weather Piece – sent during a snow storm (-:

I suggest, we can look it over briefly just to see if you have any thoughts on what they are doing, and unless there is anything major worth discussing, we can skip talking tomorrow. But, let me know, if you have an opinion, because if you want to discuss anything, and Abt is not snowed in, then that's fine to keep our 10am discussion – **Charles**, I am mainly talking to you.

Thanks, -Brian

From: Matthew Ranson [mailto:Matthew_Ranson@abtassoc.com]
Sent: Monday, February 09, 2015 11:12 AM
To: Heninger, Brian
Subject: SCC: Working draft of extreme weather report

Hi Brian,

I'm attaching our current working draft of the extreme weather report. Relative to the draft I

Ex 5

Ex 5

There is a lot of material here, and we're making good progress, but it's still very much a messy half-written document. So, while we would certainly welcome your comments and suggestions, it would probably be most productive for you to focus your review on high-level items.

Our office is closed today due to heavy snow. I'm assuming that we're planning to talk tomorrow at 10, but if we have a snow delay tomorrow, I'll email you by 9am so we can reschedule our call. And if you would prefer to wait another two weeks before you assemble the full team for a meeting, that would be fine too.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Heninger, Brian[Heninger.Brian@epa.gov]
Cc: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Bcc: griffiths.charles.epa@gmail.com[griffiths.charles.epa@gmail.com]
From: Griffiths, Charles
Sent: Thur 7/16/2015 5:50:18 PM
Subject: RE: SCC - Extreme weather report

Sorry. I should be free to talk about this tomorrow.

From: Heninger, Brian
Sent: Thursday, July 16, 2015 1:44 PM
To: Griffiths, Charles
Cc: Kopits, Elizabeth
Subject: FW: SCC - Extreme weather report

Enough said!

From: Matthew Ranson
Sent: Thursday, July 16, 2015 1:39 PM
To: Heninger, Brian
Subject: RE: SCC - Extreme weather report

Ex 4

Hi Brian,

I just checked the SCC work assignment, and at the risk of contradicting myself, I want to slightly revise what I said about no rush from Abt's side. The period of performance for this work assignments ends September 10, roughly eight weeks from today. I'll be out for a week in August, and have a couple of other short-term commitments, so there is not actually all that much calendar time left.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Matthew Ranson
Sent: Wednesday, July 08, 2015 2:52 PM
To: 'Heninger, Brian'
Cc: Griffiths, Charles
Subject: RE: SCC - Extreme weather report

Hi Brian,

Thanks--that sounds good. No rush from Abt's side; just wanted to check in.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Heninger, Brian [<mailto:Heninger.Brian@epa.gov>]
Sent: Wednesday, July 08, 2015 2:43 PM
To: Matthew Ranson
Cc: Griffiths, Charles
Subject: RE: SCC - Extreme weather report

Good Question Matt.

I have asked it myself last week with no response. There's just

Ex 5

Ex 4

Ex 4

I'll let you know as soon as I know.

Sorry about the delay, -Brian

Brian T. Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

From: Matthew Ranson

Ex 4

Sent: Wednesday, July 08, 2015 2:34 PM

To: Heninger, Brian

Subject: SCC - Extreme weather report

Hi Brian,

Hope all is well. I'm just writing to check in on the status of the SCC team's review of the extreme weather report. Do you have any sense of when you are likely to have comments back from the team?

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Shelanski, Howard[Ex 6 - Other]; Obstfeld, Maurice[Ex 6 - Other]; Mancini, Dominic J.[Ex 6 - Other]
Laity, Jim[Ex 6 - Other]; Duke, Rick[Ex 6 - Other]; Utech, Dan
G[Ex 6 - Other]; Barron, Alex[Barron.Alex@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; 'Hodson, Elke'[Elke.Hodson@Hq.Doe.Gov]
From: Linn, Joshua
Sent: Thur 6/4/2015 2:07:13 PM
Subject: Sending charge questions to NRC
2015 06 03 NAS SCC draft charge questions.docx

Ex 5

To continue momentum on the contract discussions we'd like to send the questions to NRC as soon as possible. Please send me any comments on the attached version by 9AM FRIDAY (6/5). Thanks very much.

Josh

To: Beauvais, Joel[Beauvais.Joel@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Cc: McGartland, Al[McGartland.Al@epa.gov]; Barron, Alex[Barron.Alex@epa.gov]
From: Kime, Robin
Sent: Wed 3/11/2015 7:41:45 PM
Subject: RE: NRC Board Comments

Hi

Will have it set it up for 3:00 tomorrow.

From: Beauvais, Joel
Sent: Wednesday, March 11, 2015 3:35 PM
To: Marten, Alex
Cc: McGartland, Al; Barron, Alex; Kime, Robin
Subject: Re: NRC Board Comments

Yes that would be good.

On Mar 11, 2015, at 2:56 PM, Marten, Alex <Marten.Alex@epa.gov> wrote:

Sure. Maybe we could find 30 min tomorrow afternoon or Friday morning?

Ex 5

Ex 5

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Beauvais, Joel
Sent: Wednesday, March 11, 2015 12:34 PM
To: McGartland, Al; Barron, Alex; Kopits, Elizabeth
Cc: Marten, Alex; Kime, Robin
Subject: RE: NRC Board Comments

Thanks. Can I get a read-out in the next day or so on where we are on this, and more generally on where we are and next steps on getting RTC completed and getting this off the ground?

Joel

From: McGartland, Al
Sent: Wednesday, March 11, 2015 11:17 AM
To: Beauvais, Joel; Barron, Alex; Kopits, Elizabeth
Cc: Marten, Alex
Subject: Fwd: NRC Board Comments

Fyi.

Sent from my iPhone

Begin forwarded message:

From: "Linn, Joshua" <[REDACTED] EOP email/phone >
Date: March 11, 2015 at 11:13:45 AM EDT
To: "Laity, Jim" <[REDACTED] EOP email/phone >, "Mancini, Dominic J." <[REDACTED] EOP email/phone >, "Barron, Alex" <Barron.Alex@epa.gov>, "Fawcett.allen@epa.gov" <Fawcett.allen@epa.gov>, "Marten, Alex" <Marten.Alex@epa.gov>, "McGartland, Al" <McGartland.Al@epa.gov>, "Shouse, Kate" <Shouse.Kate@epa.gov>, "Hodson, Elke (FELLOW)" <Elke.Hodson@Hq.Doe.Gov>
Subject: NRC Board Comments

Ex 5

Ex 5

Josh

Ex 5

Ex 5

Ex 5

To: Barron, Alex[Barron.Alex@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
Cc: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: McGartland, Al
Sent: Wed 3/11/2015 4:54:59 PM
Subject: RE: NRC Board Comments

I have an academic (Juleen) coming to see me at 3:00. I can push her back if I have to.

From: Barron, Alex
Sent: Wednesday, March 11, 2015 11:31 AM
To: Marten, Alex; McGartland, Al
Cc: Kopits, Elizabeth
Subject: RE: NRC Board Comments

I can be flexible anytime after noon on Friday.

From: Marten, Alex
Sent: Wednesday, March 11, 2015 11:28 AM
To: McGartland, Al; Barron, Alex
Cc: Kopits, Elizabeth
Subject: RE: NRC Board Comments

Al/Alex,

It looks like we might be free Friday afternoon for the call Josh mentions, and that would likely be easier to schedule than Monday.

Alex your schedule looks free, but Al it looks like you have a listen session follow up at 3 with Reeder, is that a requirement for you?

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: McGartland, Al
Sent: Wednesday, March 11, 2015 11:17 AM
To: Beauvais, Joel; Barron, Alex; Kopits, Elizabeth
Cc: Marten, Alex
Subject: Fwd: NRC Board Comments

Fyi.

Sent from my iPhone

Begin forwarded message:

From: "Linn, Joshua" <[REDACTED] EOP email/phone >
Date: March 11, 2015 at 11:13:45 AM EDT
To: "Laity, Jim" <[REDACTED] EOP email/phone >, "Mancini, Dominic J." <[REDACTED] EOP email/phone >, "Duke, Rick" <[REDACTED] EOP email/phone >, "Barron, Alex" <Barron.Alex@epa.gov>, "Fawcett, Allen" <Fawcett.allen@epa.gov>, "Marten, Alex" <Marten.Alex@epa.gov>, "McGartland, Al" <McGartland.Al@epa.gov>, "Shouse, Kate" <Shouse.Kate@epa.gov>, "Hodson, Elke (FELLOW)" <Elke.Hodson@Hq.Doe.Gov>
Subject: NRC Board Comments

Ex 5

Ex 5

Ex 5

Ex 5

To: Matthew Ranson[Matthew_Ranson@abtassoc.com]
Cc: Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Heninger, Brian
Sent: Mon 2/23/2015 1:17:32 PM
Subject: RE: Extreme weather draft
Extreme Weather Lit Review Draft - 2015-02-20 clean.docx

Thanks Matt! (Note to **Charles & Alex** - New Draft of Extreme Weather attached)

Let's plan to talk at 10:00 on Tuesday.

-Brian

PS – I hope all the snow storms, wind and so forth has inspired you to write on the topic of extreme weather.

From: Matthew Ranson [mailto:Matthew_Ranson@abtassoc.com]
Sent: Friday, February 20, 2015 12:38 PM
To: Heninger, Brian
Subject: SCC: Extreme weather draft

Hi Brian,

I'm attaching a copy of our latest draft of the extreme weather report. Compared to the previous

Ex 5

I'm going to be out of the office later this afternoon and Monday, but will be back Tuesday. If it works for you, I think it would be useful to talk on Tuesday at 10 with you and Alex and Charles.

Non-Responsive

To: Matthew Ranson[Matthew_Ranson@abtassoc.com]
Cc: Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Heninger, Brian
Sent: Mon 2/23/2015 1:17:32 PM
Subject: RE: Extreme weather draft
Extreme Weather Lit Review Draft - 2015-02-20 clean.docx

Thanks Matt! (Note to **Charles & Alex** - New Draft of Extreme Weather attached)

Let's plan to talk at 10:00 on Tuesday.

-Brian

PS – I hope all the snow storms, wind and so forth has inspired you to write on the topic of extreme weather.

From: Matthew Ranson [mailto:Matthew_Ranson@abtassoc.com]
Sent: Friday, February 20, 2015 12:38 PM
To: Heninger, Brian
Subject: SCC: Extreme weather draft

Hi Brian,

I'm attaching a copy of our latest draft of the extreme weather report. Compared to the previous

Ex 5

I'm going to be out of the office later this afternoon and Monday, but will be back Tuesday. If it works for you, I think it would be useful to talk on Tuesday at 10 with you and Alex and Charles.

Non-Responsive

Non-Responsive

Hope you have a good weekend,

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

O: 617.520.2484 | F: 617.386.7568 | www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

Non-Responsive

Hope you have a good weekend,

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

55 Wheeler Street | Cambridge, MA 02138

O: 617.520.2484 | F: 617.386.7568 | www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Newbold, Steve[Newbold.Steve@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]
From: McGartland, Al
Sent: Sun 2/8/2015 2:11:33 PM
Subject: Re: anyone want to speak on SCC April 23 in Minnesota?

Non-Responsive

Ex 5

Sent from my iPhone

On Feb 8, 2015, at 7:27 AM, Newbold, Steve <Newbold.Steve@epa.gov> wrote:

Barring any pre-existing family commitments I would be happy to do this if no one else is eager to go. I will be giving a presentation on the SCC in New Haven at the end of this month, so I will have already prepared remarks on this topic. But I'm also happy to hand off my slides if someone else would like a turn.

Steve Newbold
U.S. EPA
National Center for Environmental Economics (NCEE)
EPA West, 4316T, MC 1809T
1200 Pennsylvania Ave NW
Washington, DC 20004
(202) 566-2293

From: McGartland, Al
Sent: Friday, February 06, 2015 5:11 PM
To: Newbold, Steve; Marten, Alex; Griffiths, Charles; Wolverton, Ann
Subject: anyone want to speak on SCC April 23 in Minnesota?

I think the talk is to at a law conference. I will know more early next week.

To: Heninger, Brian[Heninger.Brian@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
Bcc: griffiths.charles.epa@gmail.com[griffiths.charles.epa@gmail.com]
From: Griffiths, Charles
Sent: Thur 5/7/2015 5:47:55 PM
Subject: RE: Meeting on May 20?

Hi Brian. Thanks for following up on this.

The 20th works for me, but I think we have a speaker from 2-3:30. Can we schedule this meeting from 3:30-4:00?

Thanks,

Charles

From: Heninger, Brian
Sent: Thursday, May 07, 2015 1:16 PM
To: Griffiths, Charles; Kopits, Elizabeth
Cc: Marten, Alex
Subject: RE: Meeting on May 20?

Charles,

So, Are you up for this meeting then? If so, Matt suggests 3 or 3:30 (see e-mail copied below.)

For scheduling purposes: Yes/No, what time? Do you want me to reply or you?

-Brian

From: Matthew Ranson [

Ex 4

Sent: Thursday, May 07, 2015 12:46 PM

To: Heninger, Brian

Subject: RE: Meeting on May 20?

Hi Brian,

Thanks! My schedule is still a little in flux, but it looks like 3pm or 3:30pm on May 20 would work best (for either a half hour or hour meeting). Obviously, this depends on whether you and the team would be ready to meet by then.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Kopits, Elizabeth

Sent: Wednesday, May 06, 2015 1:02 PM

To: Griffiths, Charles; Marten, Alex; Heninger, Brian

Subject: RE: Meeting on May 20?

Thanks, Charles. As we just discussed, I would be happy to join the meeting on the 20th, and will try but can't promise to have comments on the report by then.

Thanks!

E.

From: Griffiths, Charles
Sent: Wednesday, May 06, 2015 12:41 PM
To: Marten, Alex; Heninger, Brian
Cc: Kopits, Elizabeth
Subject: RE: Meeting on May 20?

I can probably have comments by the 20th. Elizabeth, did you want to jump back into this or should I just brief you guys before I talk to Matt?

Charles

From: Marten, Alex
Sent: Tuesday, May 05, 2015 5:00 PM
To: Heninger, Brian; Griffiths, Charles
Cc: Kopits, Elizabeth
Subject: RE: Meeting on May 20?

I can pretty much guarantee I will not have read the report by the 20th and its highly unlikely I will be able to spend any serious time w/ it until June. So I will leave this up to the others.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Heninger, Brian

Sent: Tuesday, May 05, 2015 4:17 PM
To: Griffiths, Charles; Marten, Alex
Cc: Kopits, Elizabeth
Subject: FW: Meeting on May 20?

Hi Charles, Alex and Elizabeth?

Matt will be in town on May 20th (see below.) We can have a no cost meeting with him on finalizing this project/work assignment if we are ready to talk by then. Let me know if this sounds like a desirable thing to do (for even just one of you, or any many as interested.)

- Brian

From: Matthew Ranson
Sent: Tuesday, May 05, 2015 4:09 PM
To: Heninger, Brian
Subject: Meeting on May 20?

Ex 4

Hi Brian,

Quick question for you. I'll be in D.C. in two weeks to give a presentation at the Society of Government Economists conference. Do you think you and the SCC team will have completed your review of the extreme weather report by then? Since I'm flying to D.C. the day before the conference, it would be a good opportunity to meet in person to go over your comments and plan next steps on wrapping up this project.

Right now I'm free at 11am, 3pm, or 4pm on May 20. Let me know if any of those times might work.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Matthew Ranson

Sent: Monday, May 04, 2015 12:36 PM

To: 'Heninger, Brian'

Subject: RE: SCC update

Hi Brian,

Sure, that sounds good. Let me know when you're ready to talk.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

O: 617.520.2484 | F: 617.386.7568 | www.abtassociates.com/environment

From: Heninger, Brian [<mailto:Heninger.Brian@epa.gov>]

Sent: Monday, May 04, 2015 11:49 AM

To: Matthew Ranson

Cc: Griffiths, Charles; Marten, Alex; Lisa Tarquinio; Audrey Lew; Kopits, Elizabeth

Subject: RE: SCC update

Hi Matt,

Ex 5

Thanks, -Brian

Brian Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

From: Matthew Ranson

Ex 4

Sent: Friday, May 01, 2015 9:18 PM

To: Heninger, Brian

Cc: Griffiths, Charles; Marten, Alex; Lisa Tarquinio; Audrey Lew

Subject: RE: SCC update

Hi Brian,

I'm pleased to send you a near-complete draft of the extreme weather report. I've added some notes for you in a couple of places, but except for that it's a clean copy. As I mentioned in my previous email, I think the report is at a point where it would be good for you and the NCEE SCC team to review carefully.

We'll plan to hold off on any further work until we hear back from you. Please let me know if you would like to set up a meeting in the next couple of weeks, either as a prelude to your review, or once you have comments.

Lisa and Audrey and I will look forward to your thoughts and suggestions about the document.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

From: Matthew Ranson

Sent: Wednesday, April 29, 2015 10:33 AM

To: Brian Heninger <Heninger.Brian@epa.gov>

Cc: Griffiths, Charles (Griffiths.Charles@epa.gov); Alex Marten (Marten.Alex@epa.gov)

Subject: SCC update

Hi Brian,

Ex 5

I'm planning to send you a complete, clean draft of the SCC report by Monday morning. It has come a long way since the last version, in terms of coverage of analytical and empirical topics in the literature. It has also gotten quite long--I think it's about 90 pages right now. However, we've tried hard to smooth out the writing, and have moved a lot of material into appendices.

Overall, I think it's turned into a pretty good report. I think a useful next step would be for you and the SCC team to review the document carefully, and let us know what further comments and suggestions you have. Since we are getting towards the end of this work assignment--I'm

Non-Responsive

Non-Responsive

Ex 5

Ex 5

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

Ex 4

www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Durham, Natalie[Durham.Natalie@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Dockins, Chris[Dockins.Chris@epa.gov]; Simon, Nathalie[Simon.Nathalie@epa.gov]; Maguire, Kelly[Maguire.Kelly@epa.gov]; Moore, Chris[Moore.Chris@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]
From: McGartland, Al
Sent: Mon 7/20/2015 8:31:06 PM
Subject: Fwd: meeting with NCEE

I was thinking of two meetings one on scc and the other d **Non-Responsive** But if we want three we can do that I'm sure.

Sent from my iPhone

Begin forwarded message:

From: "Rennert, Kevin" <Rennert.Kevin@epa.gov>
Date: July 20, 2015 at 4:27:42 PM EDT
To: "Means-Thomas, Janet" <Means-Thomas.Janet@epa.gov>
Cc: "Kime, Robin" <Kime.Robin@epa.gov>, "McGartland, Al" <McGartland.Al@epa.gov>
Subject: meeting with NCEE

Janet – could you please work with Natalie to set up a meeting with Al and his Social Cost of Carbon team (listed in his email response below) for later this week or early next week?

Al will also be sending along the staff he'd like included for an additional meeting as well, to cover NCEE's current and upcoming work with **Non-Responsive**, so when he provides that, could you please also find some time for that meeting as well? Thank you!

Best,

Kevin

From: McGartland, Al
Sent: Monday, July 20, 2015 4:19 PM
To: Rennert, Kevin

Subject: Re: follow-up

I don't think order matters too much (unless it takes a long time to meet).

Having Janet work with us would work well. I suspect your calendar will get more crowded so having her involved will make it easiest to accommodate possible changes. Janet knows my admin asst (Natalie). They can figure it out. Later this week will probably work.

For scc, if like to invite the scc team. (Elizabeth, Steve, Alex Charles and ann Wolverton).

We might want to add a briefing on **Non-Responsive** I'm close to recommending that we start one or two of them.

Sent from my iPhone

On Jul 20, 2015, at 4:12 PM, Rennert, Kevin <Rennert.Kevin@epa.gov> wrote:

All sounds good to me. Do you think that's the appropriate order as well – SCC before **Non-Responsive** Either is ok with me. Shall I ask Janet to coordinate a good time with you and your staff for each of those meetings for later this week / early next week?

Thanks,

Kevin

From: McGartland, Al
Sent: Monday, July 20, 2015 2:03 PM
To: Rennert, Kevin
Subject: Re: follow-up

I'm very flexible. Maybe one meeting in scc.

Ex 5

Ex 5

We can do **Non-Responsive** in a second meeting. **Non-Responsive** You may

Non-Responsive

Non-Responsive

. Btw

I'm at these Econ meetings in Boston today. So is Elizabeth.

Non-Responsive

Non-Responsive

The meeting is by

invite only but it's a good chance to learn where these folks are going on energy efficiency, scc, and even fracking.

Sent from my iPhone

On Jul 20, 2015, at 12:57 PM, Rennert, Kevin <Rennert.Kevin@epa.gov> wrote:

Al – thanks again for the overview briefing last week. It was great to get a sense of everything that's on the horizon and the way that you're approaching all of it. I was hoping that I could do some targeted follow up with you and the relevant staff on

- The NAS/SCC meeting (I can reach out directly to Elizabeth on this if you like – we've already been in touch about the contract).

- **Non-Responsive**

- How would you suggest we tackle these – in one meeting, or in a few shorter, more targeted meetings?

Thanks!

Kevin

To: Griffiths, Charles[Griffiths.Charles@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Heninger, Brian
Sent: Thur 7/16/2015 5:56:42 PM
Subject: FW: SCC update
Extreme Weather Lit Review Draft - 2015-05-01.docx

There's not much to talk about, but I am here and happy to discuss.

I'll make this as easy as possible.

1. Here's the last draft attached.
2. Make some comments and tell me what you want Abt to do.
3. There's only about **Ex 5** left, so this is the LAST set of instructions to Abt.

I will be out of the office 7/30 - 8/12.

Thanks, -Brian

Brian T. Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

From: Griffiths, Charles
Sent: Thursday, July 16, 2015 1:50 PM
To: Heninger, Brian
Cc: Kopits, Elizabeth
Subject: RE: SCC - Extreme weather report

Sorry. I should be free to talk about this tomorrow.

From: Heninger, Brian
Sent: Wednesday, July 01, 2015 1:27 PM
To: Charles Griffiths ; Marten, Alex; Elizabeth Kopits
Subject: FW: SCC update

OK Guys, this is it, last time.

Non-Responsive

I am leaving 1 month from today and the contract is done right after I get back. When Charles gets back from vaca we need to either send some Abt some comments

Ex 5

Ex 5

Cheers, -Brian

Brian T. Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

From: Matthew Ranson [mailto:Matthew_Ranson@abtassoc.com]

Sent: Friday, May 01, 2015 9:18 PM

To: Heninger, Brian

Cc: Griffiths, Charles; Marten, Alex; Lisa Tarquinio; Audrey Lew

Subject: RE: SCC update

Hi Brian,

I'm pleased to send you a near-complete draft of the extreme weather report. I've added some notes for you in a couple of places, but except for that it's a clean copy. As I mentioned in my previous email, I think the report is at a point where it would be good for you and the NCEE SCC team to review carefully.

We'll plan to hold off on any further work until we hear back from you. Please let me know if you would like to set up a meeting in the next couple of weeks, either as a prelude to your review, or once you have comments.

Lisa and Audrey and I will look forward to your thoughts and suggestions about the document.

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

From: Matthew Ranson
Sent: Wednesday, April 29, 2015 10:33 AM
To: Brian Heninger <Heninger.Brian@epa.gov>
Cc: Griffiths, Charles (Griffiths.Charles@epa.gov); Alex Marten (Marten.Alex@epa.gov)
Subject: SCC update

Hi Brian,

Ex 5

I'm planning to send you a complete, clean draft of the SCC report by Monday morning. It has come a long way since the last version, in terms of coverage of analytical and empirical topics in the literature. It has also gotten quite long--I think it's about 90 pages right now. However, we've tried hard to smooth out the writing, and have moved a lot of material into appendices.

Overall, I think it's turned into a pretty good report. I think a useful next step would be for you and the SCC team to review the document carefully, and let us know what further comments and suggestions you have. Since we are getting towards the end of this work assignment--I'm

Ex 5

Thanks,

Matt

Matthew Ranson, Ph.D | Associate | Abt Associates

Environment and Natural Resources Division

55 Wheeler Street | Cambridge, MA 02138

O: 617.520.2484 | F: 617.386.7568 | www.abtassociates.com/environment

This message may contain privileged and confidential information intended solely for the addressee. Please do not read, disseminate or copy it unless you are the intended recipient. If this message has been received in error, we kindly ask that you notify the sender immediately by return email and delete all copies of the message from your system.

To: Heninger, Brian[Heninger.Brian@epa.gov]
Cc: Newbold, Steve[Newbold.Steve@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Griffiths, Charles
Sent: Tue 2/3/2015 7:18:32 PM
Subject: RE: Abt's SCC Work

Thanks for the update, Brian. This sounds like a good approach. I'll be prepared to make comments on the next draft.

Charles

Charles Griffiths
National Center for Environmental Economics
Room 4334B, WJC West, Mail Code 1809T
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Phone: 202/566-2288 Fax: 202/566-2338
Email: griffiths.charles@epamail.epa.gov

From: Heninger, Brian
Sent: Tuesday, February 03, 2015 1:30 PM
To: Griffiths, Charles
Cc: Newbold, Steve; Wolverton, Ann; Marten, Alex
Subject: Abt's SCC Work

Hi Charles,

I did talk to Matt at Abt briefly today, and he was actually still digging out his car from last night's snow at 10am, so he was not available this morning anyway. I let him know that Elizabeth is now out, and you are officially "the man," but others may chime in also.

He is having his monthly check-in with Mike Fischer on this project today, so we just touched base on a couple items.

Schedule and Direction:

Ex 5

Ex 5

Let me know if you have any questions or concerns.

-Brian

Brian Heninger

Economist / OP Quality Assurance Manager

U.S. Environmental Protection Agency

Office of the Administrator, Office of Policy (OP)

National Center for Environmental Economics

202-566-2270

To: Shouse, Kate[Shouse.Kate@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 5/26/2015 3:20:32 PM
Subject: RE: latest version of HD preamble/RIA

Thanks, Kate. I just talked to Cay too and she said she would send us both the latest version. I am happy to take a stab at it and send to you.

As for Alex B, in our conversation this morning he sounded like this was decided.

From: Shouse, Kate
Sent: Tuesday, May 26, 2015 11:18 AM
To: Kopits, Elizabeth
Subject: Re: latest version of HD preamble/RIA

Thanks! Just talked to Cay and sounds like she is going to send us the latest version. Do you want to take the first stab or would you rather I draft it? I just sent the corrected numbers to Todd [REDACTED] Ex 5

[REDACTED] Ex 5 He has meetings most of the morning so may not be able to review until the afternoon.

Also, just to confirm, did Alex Barron say he was okay with this approach or still considering it? I ask because OTAQ was under the impression that this was still under deliberation, not sure if I misunderstood or if people are still closing loops.

Thanks,
Kate

From: Kopits, Elizabeth
Sent: Tuesday, May 26, 2015 9:25 AM
To: Shouse, Kate
Subject: FW: latest version of HD preamble/RIA

From: Klemick, Heather
Sent: Tuesday, May 26, 2015 9:19 AM
To: Helfand, Gloria
Cc: Nagelhout, Peter; Wolverton, Ann; Kopits, Elizabeth
Subject: latest version of HD preamble/RIA

Hi Gloria (and Peter, you might have these too),

I realize I'm not sure that I have the final/current version of the HD rule preamble and RIA. Non-Responsive
Non-Responsive Elizabeth and the SCC team need to add some new language (a paragraph and some table footnotes) related to the TSD, and I don't want to create version control problems by sending them outdated text.

Thanks!

Heather

To: Marten, Alex[Marten.Alex@epa.gov]
From: Shouse, Kate
Sent: Tue 4/14/2015 8:01:32 PM
Subject: RE: SCC website

Will do. So far I'm not hearing a strong preference here either. I checked with our web person and it shouldn't be a big deal to post the update (updates done within a day or so). I'm going to propose some language in a Word copy of the page and circulate this week

Non-Responsive

Non-Responsive

From: Marten, Alex
Sent: Monday, April 13, 2015 4:26 PM
To: Shouse, Kate
Subject: RE: SCC website

Thanks Kate. Personally I think this makes sense. OP management didn't have a particularly strong preference last time I checked in. If you hear anything from your management with regards to a preference please let me know.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Shouse, Kate
Sent: Tuesday, April 07, 2015 4:00 PM
To: Marten, Alex
Subject: SCC website

Hi, Alex. If there's interest in posting the methane reviews on the web, I think we could set up a link on this site: <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>

Was thinking we could add a paragraph (2-3 sentences) above “For more information see...”

Ex 5

Ex 5

The sentence on the application peer-review could provide links to PDFs of the three responses we received.

Would also be a good opportunity to update the SC-CO2 table to 2012\$ and update the notation throughout the page (SCC to SC-CO2, etc).

Please keep me posted if you receive any management feedback and I’ll check in with Allen and others in OAR.

Thanks,
Kate

From: Linn, Joshua

Location: Conference call: Dial **Passcode:**

Importance: Normal

Subject: SCC IWG conference call on response to comments

Start Date/Time: Fri 5/22/2015 5:00:00 PM

End Date/Time: Fri 5/22/2015 5:30:00 PM

..
23

Dear Members of the SCC IWG:

Apologies for the late notice and proximity to the holiday weekend, but we'd like to hold a conference call to discuss the status of the Response to Comments. The call will take place 1-1:30pm on Friday May 22. The call-in information is:

Bridg

Num

Conf

Pass

Hope you can make it, and please let me know if you can't and would like to follow up separately.

Josh

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Cropper, Maureen
Sent: Tue 7/7/2015 5:56:10 PM
Subject: Do You Have 5 Minutes to Talk?

I'm at Personal cell/email

From: Kopits, Elizabeth [Kopits.Elizabeth@epa.gov]
Sent: Tuesday, July 07, 2015 9:14 AM
To: Cropper, Maureen
Subject: RE: Who Performed the Computations for the SCC?

Hi Maureen,

Great to hear from you. The actual runs were done by us – Alex Marten, Steve Newbold, Charles Griffiths, and me.

All is well here. You may have heard I had another baby in January – Ex 6 - Other
Ex 6 - Other

Hope to talk/see you soon.

Best,

Elizabeth

From: Cropper, Maureen [mailto:mcropper@econ.umd.edu]
Sent: Tuesday, July 07, 2015 9:04 AM
To: Kopits, Elizabeth
Subject: Who Performed the Computations for the SCC?
Importance: High

Elizabeth,

Who performed the actual computations for the SCC? Were they performed by EPA staff or someone else?

I hope all is well with you!

With best wishes,
Maureen

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Cropper, Maureen
Sent: Tue 7/7/2015 4:08:21 PM
Subject: RE: Who Performed the Computations for the SCC?

Elizabeth,

Ex 6 - Other

Best,

Maureen

From: Kopits, Elizabeth [Kopits.Elizabeth@epa.gov]
Sent: Tuesday, July 07, 2015 9:14 AM
To: Cropper, Maureen
Subject: RE: Who Performed the Computations for the SCC?

Hi Maureen,

Great to hear from you. The actual runs were done by us – Alex Marten, Steve Newbold, Charles Griffiths, and me.

All is well here. You may have heard I had another baby in January.

Ex 6 - Other

Ex 6 - Other

Hope to talk/see you soon.

Best,

Elizabeth

From: Cropper, Maureen [mailto:mcropper@econ.umd.edu]
Sent: Tuesday, July 07, 2015 9:04 AM
To: Kopits, Elizabeth
Subject: Who Performed the Computations for the SCC?
Importance: High

Elizabeth,

Who performed the actual computations for the SCC? Were they performed by EPA staff or someone else?

I hope all is well with you!

With best wishes,
Maureen

From: Snyder, Brett
Location: DCRoomWest4424G/OPEI
Importance: Normal
Subject: Meeting with Abt AER on climate work - conference call-in number:
and code:
Start Date/Time: Tue 6/9/2015 3:00:00 PM
End Date/Time: Tue 6/9/2015 4:00:00 PM
[Abt Environmental Research \(Stratus\) Resumes for NCEE 2015-06-01.pdf](#)

Hi - Mike Fisher (Abt) would like to arrange for a meeting between NCEE staff and some of the personnel joining Abt as part of their acquisition of Stratus Consulting.

I have booked the 4424-G conference room for one hour (11-noon on Tuesday, June 9), and conference call-in number:

Attached pdf file provided by Mike that contains resumes of some of the Stratus personnel.

Message from Mike Fisher:

You may have heard that Abt Associates acquired Stratus Consulting in February. As you probably know, Stratus has strong capabilities in environmental and resource science and economics, which is the reason we sought the business combination. Although the former Stratus business (now called Abt Environmental Research, AER) will operate for several months as a separate subsidiary within Abt Associates, we have begun the process of integrating AER's staff with Abt Associates' Environment and Natural Resources Division (ENR), the business unit that you have known for years. The integration steps include introducing AER staff and capabilities to selected organizations and individuals, such as NCEE. Concerning NCEE, AER has several staff with strong experience in climate change-related science and economics, which we think may be of interest to NCEE in its work on social cost of carbon and related climate change issues. A sample of these individuals includes:

- Karen Carney, Ph.D., Geological and Environmental Sciences, Stanford University. Climate change-related work includes impact on the following sectors: coral reef cover, terrestrial ecosystem carbon storage, wildfire frequency and severity, recreational fishing, flooding damage, bridge degradation and replacement, water supply and demand, and human mortality associated with extreme heat.
- Nimmi Damodaran, Ph.D., Public Policy, Carnegie Mellon University. Climate change-related work focuses on international mitigation of SLCPs, with substantial work concerning the municipal solid waste sector.
- Cameron Wobus, Ph.D., Earth Sciences, Massachusetts Institute of Technology. Climate change-related work focuses on climate change impacts on landscapes and human systems, including erosion of permafrost-dominated coastal bluffs in the Arctic, impact on morphology of river systems, and climate change-related flood damage.
- Russ Jones, MA, Geography, University of California. Climate change-related work focuses on sea level rise and changes in average and extreme precipitation and temperature and the associated impacts to coastal infrastructure, recreational fishing, terrestrial carbon storage, wildfire, inland flooding, and extreme heat.
- David Mills, MA, Economics, University of Colorado. Climate change-related work focuses

on evaluating human health and bio-physical impacts from climate-sensitive stressors, including extreme temperatures, air pollution, and wildfires.

- Joseph Donahue, MPP, Environmental and Regulatory Policy, Georgetown University. Climate change-related work focuses on impact of short-lived climate pollutants, including black carbon, methane, and hydrofluorocarbons, and mitigation strategies.
- Joel Smith, MPP, Public Policy, University of Michigan. Climate change-related work focuses on impact and adaptation planning, at national, state and local levels, and in U.S. and international settings.

I wonder if it would be possible to set up a meeting to introduce one or more of these individuals and their capabilities to appropriate staff from NCEE. Most likely AER candidates for a meeting are Karen Carney and Dave Mills. One or more additional AER staff could participate by phone. In addition, someone from the Abt Associates environment practice - probably Matt Ranson, who leads our current SCC-related work with NCEE - would be present for a meeting.

I envision an informal session in which the AER staff could describe their work, areas of expertise, etc., that may be of interest to NCEE. This would be like the meeting that Matt Ranson had with you, Ann Wolverton, Elizabeth Kopits, Alex Marten, and Dave Evans (I think this is the group) a couple of years ago. If you could help set this up, I would appreciate that very much.

From our calendars, good times for 'us' to do this would be mid-day (11am-2pm) on Tuesday, June 9, or the afternoon (1pm-5pm) of Wednesday, June 10. June 11 is also possible. These happen to be days when one or more of the candidates are already planning to be in DC. If none of these times work, we can think about different weeks/days. If it would help to talk about this, let me know.

Best regards,
Mike Fisher

Michael Fisher | Vice President, Environment and Natural Resources | **Abt Associates**
55 Wheeler Street | Cambridge, MA 02138
O: 617-349-2526 | F: 617-386-8404 | M: 857-998-7629 | www.abtassociates.com

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Marten, Alex
Sent: Mon 7/6/2015 11:35:39 AM
Subject: Fwd: update on possible NCEE Summer Internship
[image001.jpg](#)

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

Begin forwarded message:

From: "Marten, Alex" <Marten.Alex@epa.gov>
Date: July 2, 2015 at 5:59:52 PM EDT
To: "Snyder, Brett" <Snyder.Brett@epa.gov>, Brett Cease <Personal cell/email>
Cc: "Kopits, Elizabeth" <Kopits.Elizabeth@epa.gov>
Subject: RE: update on possible NCEE Summer Internship

Brett,

Per our phone conversation earlier, and the request in your previous email I wanted to provide you with some background reading materials and some that are more forward looking.

The original 2010 U.S. Government technical support document (TSD) on the SCC provides good background on the SCC in general and the U.S. estimates in particular:

<http://www.epa.gov/oms/climate/regulations/scc-tsd.pdf>

These estimates were updated in 2013 in a new TSD which describes the nature of the updates. Just today a revised version of that TSD was posted with some minor technical corrections. A link to that TSD along

with a link to a new response to comments on the SCC and future plans for the SCC can be found on a Whitehouse blog post from this afternoon:

<https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions>

A very in-the-weeds description of one of the integrated assessment models we will likely work with is provided below. Maybe the most relevant part is description of how health impacts are modeled.

https://05f0e81c-a-5f9963c9-s-sites.googlegroups.com/a/fund-model.org/fund-model/Fund-3-9-Scientific-Documentation-Draft.pdf?attachauth=ANoY7cqQoN2T1QMFfNptVGDleog9LHADKnqItEpb6kwpbuSvhAcD9ysaGOFkuoQaTMvan50IzDSnk81D0f1uQ1v2qfs-PpbIGQGu9SbTAM1skxYkSTZ_MrYUC-CwK64nK50c1UMAHgSlfA66hKJdpMwtVSCD38Q7Rn6_TONMMozN0dIHt026uVyv-rzueMB835USj0Z56SochhsLZLF4mmjUL0flIB1&attredirects=0

While the previous pieces are more background, thinking ahead to what we will want to start digging into next week when you start, are the recent WHO report on climate change health risks:

http://apps.who.int/iris/bitstream/10665/134014/1/9789241507691_eng.pdf?ua=1

And the IPCC human health chapter in its fifth assessment report (AR5):

http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap11_FINAL.pdf

From, the other Brett's email it sounds like things are moving ahead, even if slowly. Talk to you soon.

--

Alex L. Marten

phone: (202) 566-2301
email: marten.alex@epa.gov

From: Snyder, Brett
Sent: Thursday, July 02, 2015 5:36 PM
To: Brett Cease
Cc: Marten, Alex; Kopits, Elizabeth
Subject: RE: update on possible NCEE Summer Internship

Hi Brett – we are making some progress (slowly) on the volunteer position. We have a couple of things for your information and review/signature.

I have a short project description, which I hope captures aspects of the work discussed with our staff (Alex and Elizabeth).

There is also a Volunteer Service Agreement prepared for your review and signature. We still haven't heard a final word on the implications (if any) of you holding concurrent volunteer positions with EPA and Environment America – there were several key staff out with the holiday this week, but I will press at the start of next week to make progress on resolving the question. I have attempted to leave open the prospects for working for both organizations on the Service Agreement, providing for the amount of time to be volunteered to fall between 32-40 hrs per week.

If the Agreement looks acceptable, please sign and return. We believe we have the rest of the documentation required, but if we learn of anything more that might be needed, we will let you know. In recognition that there might still be some time needed to clear materials through EPA, I have proposed a start date of Wednesday, July 9. Hope to have a better sense of the viability of that start date after next Monday.

Thanks again for your patience, and will be updating you next week.

Brett Snyder

USEPA, NCEE
202-566-2261

From: Brett Cease [mailto:[Personal cell/email](#)]
Sent: Tuesday, June 30, 2015 11:18 AM
To: Snyder, Brett
Subject: Re: update on possible NCEE Summer Internship

Good morning Brett,

I hope this email finds you faring well.

I apologize that in my swift response to your paperwork request this past Friday I sent you an outdated copy of my work responsibilities with Environment America this summer. I attached the original proposal form that was sent to me before I had accepted the position. The actual responsibilities I have this summer are included in my current draft provided below, which you will see feature a much more limited role on the hydraulic fracturing front.

I hope this clarification is helpful and I look forward to helping provide any additional information as needed from my end.

With appreciation,

Brett Cease

On Fri, Jun 26, 2015 at 3:47 PM, Brett Cease <[Personal cell/email](#)> wrote:

Brett,

Thank you again for your time on the phone this afternoon and for coordinating all of these various strands of paperwork.

Here is the information you've requested:

1. I have included an unofficial transcript from UT-Dallas that highlights my prior semesters, current, and fall enrollment. Let me know if you need any additional information on this front.

2. I am happy to draft up anything you will need in addition to my cover letter and prior emails, just let me know.

3. I've filled in the missing fields from the form you provided below. As we spoke about, I am very flexible regarding whenever it will work for me to begin and especially given the somewhat brief window I would absolutely love to keep working/volunteering remotely from back in Texas following the end of our summer program, however we can make this possible. Let me know and I will be happy to register for another internship credit in the fall or any other formal paperwork trail. The University of Texas at Dallas is located at 800 W Campbell Rd, Richardson, TX 75080.

Arrival Date Proposed	Actual Arrival Date	Proposed Termination	Actual Termination
July 6, 2015		August 14, 2015	
Sponsored by Educational Institution		Name and Address of Institution (if "YES")	
<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	University of Texas at Dallas	

4. I am volunteering with Environment America overall, not their research and policy

center exclusively. As a result, I've attached a description of my job duties below under the "Graduate Program 2015..." title. As we discussed over the phone as well, if it comes down to having to choose between one internship site or the other, given the possibilities that working with EPA will provide for my dissertation research along with its alignment with my future career interests, I will unhesitatingly be happy to volunteer exclusively with the EPA, just let me know what you advise.

5. As for contacts, yes, the best email is [Personal cell/email] (if we want it to be more professional [Personal cell/email] is equally fine). My cell of [Personal cell/email] will be the best phone number.

I hope this is all helpful and look forward to continuing to provide anything else you might need.

With appreciation,

Brett Cease

On Fri, Jun 26, 2015 at 1:50 PM, Snyder, Brett <Snyder.Brett@epa.gov> wrote:

Hi Brett –

We are collecting some other information from our human resources office before we can make you an official offer, but there are a few things we would appreciate your providing to help us keep the process moving forward:

1. Confirmation of your continuing enrollment in your program. For other student volunteers, this is often something from the registrar's office (transcript) or other document that serves to show you are registered or enrolled for the upcoming Fall 2015 term. Might also be helpful to include official documentation from the school about your summer-in-DC program.
2. Statement of your education purpose/goals in accepting the student

volunteer position: I think your cover letter and emails provide what information we need.

3. There is a standard EPA form that has a few sections (below) you can help us to complete. I have listed a proposed start date of July 6 – would be great if it could work out for everyone to be sooner, but I suspect it will be difficult to get everything taken care of before that date. Also need to provide proposed end date, and a central address for the university. Once we complete the other parts of this form, we can send you a scanned copy to sign, scan and return to us.

Arrival Date Proposed

Actual Arrival Date

Proposed Termination

Actual Termination

July 6, 2015

Sponsored by Educational Institution

August __, 2015

Name and Address of Institution (if "YES")

☒ **YES**

☐ **NO**

4. Last, we are checking with our personnel staff to determine whether there needs to be any other established for your volunteer appointment, given you are also volunteering for an environmental advocacy organization. Would it be possible to get some more specific information on your duties or responsibilities with Environment America? Can you also clarify whether you are volunteering with their main organization, or with their Research and Policy Center?

Our EPA security clearance process will start after we make headway on some other paperwork on our end. They will want to know the best ways to reach you, so should we recommend your gmail account for email, and the cell phone number on your resume - Personal cell/email

Thanks again,

Brett Snyder

USEPA, NCEE
202-566-2261

From: Brett Cease [mailto:] **Personal cell/email**
Sent: Friday, June 26, 2015 9:33 AM
To: Marten, Alex
Cc: Snyder, Brett; Kopits, Elizabeth
Subject: Re: update on possible NCEE Summer Internship

Good morning Alex and Elizabeth,

I just wanted to send a thank you note to you both expressing my appreciation for our conversation yesterday and the invitation to join in the SCC project research this summer focusing on updating human health costs data. The chance to learn from the NCEE has truly been a dream of mine and I look forward to the chance to collaborate and be of service in the summer ahead.

Brett, whenever is convenient for you I look forward to being in touch regarding details on the next best steps to provide any information needed for HR, security, schedules, and anything else that may be helpful.

I am available to begin work or to even stop by to provide any documents whenever is convenient for your team.

I hope you all have a wonderful close to your week today and I look forward to the work ahead.

With gratitude,

Brett

On Thu, Jun 25, 2015 at 8:22 AM, Brett Cease <Personal cell/email> wrote:

Alex,

11:10 this morning sounds great. I'll look forward to giving you a call and hearing more about the project then.

Have a great morning everyone,

Brett

On Wed, Jun 24, 2015 at 6:27 PM, Marten, Alex <Marten.Alex@epa.gov> wrote:

Hi Brett,

Why don't you give me a call at around 11:10 tomorrow and I can fill you in about our office and the SCC related project we thought might be of mutual interest. My number is 202-566-2301.

Thanks.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

On Jun 24, 2015, at 4:42 PM, Brett Cease <Personal cell/email> wrote:

Brett,

How wonderful to hear from you, especially in regards to a new potential project with the NCEE. There very well could be some ways that I will be available to be of service for part of my current DC experience in the months ahead until the middle of August.

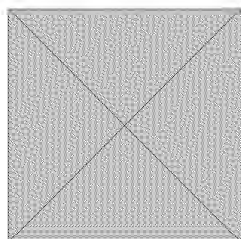
I look forward to the chance to hear more about the project and will be available to talk any time between 11 am and 1 pm that will work best for you.

I hope you're been enjoying the beginning of summer, let me know if this is a window that will work.

With thanks,

Brett

Personal cell/email



On Wed, Jun 24, 2015 at 3:29 PM, Snyder, Brett
<Snyder.Brett@epa.gov> wrote:

Hi Brett:

I am writing to let you know that our office has some new summer projects we are considering pursuing with the help of a summer intern, and there might be one of potential interest

to you, should you still be open to an assignment with us as part of your DC program.

If interested, would you have any time to talk about it by phone some time tomorrow (Thursday, June 25)? If so, please write or call, and we can schedule a time to talk. We can share with you more information on the project and see whether it could be a good match.

Thanks and talk to you soon.

Brett Snyder

USEPA, NCEE

202-566-2261

Via mobile device

On May 11, 2015, at 10:11 AM, Brett Cease

< **Personal cell/email** > wrote:

Brett,

Thank you for letting me know about the updates with EPA's hiring for this summer. I truly appreciate your ongoing communication and generous consideration throughout the whole process.

I would be honored to remain in touch regarding any upcoming seminars and will be sure to stay in touch regarding any future job seeking I begin once I finish my degree in the coming years.

Have a wonderful summer and thank you again.

With gratitude,

Brett

On Wed, May 6, 2015 at 4:31 PM, Snyder, Brett
<Snyder.Brett@epa.gov> wrote:

Hi Brett – I checked in with our staff on their projects and needs for student assistance, and it looks like they have some suitable matches lined up. We received approval of our projects at the end of last week, enabling us to proceed and reach out to candidates. It looks like the kind of work our staff have in mind for student volunteers is better suited persons having entry-level research assistant skills and experiences, and therefore aren't really good matches someone having your advanced skills and abilities. So I hope that the other opportunity proves to work out well, and perhaps there will be another opportunity down the road to fill an EPA position – whether another summer position or perhaps something more permanent when you enter the job market?

Thank you again for your interests, and hope you have a great experience in Washington this summer. We have some seminar series we host, and we will probably have a few summer events, so if you want to be alerted to them as they come up, please let us know.

Sincerely,

Brett Snyder

From: Brett Gmail
[mailto:[Personal cell/email](#)]
Sent: Wednesday, May 06, 2015 10:41 AM
To: Snyder, Brett
Subject: Re: NCEE Summer Internship

Good Morning Brett,

I hope this email finds you enjoying the middle of a rewarding week.

I wanted to touch base with you and any of the EPA offices this morning to see where you're at in the intern decision making process for this summer.

I have an offer to respond to by the end of today, but wanted to let you know that the EPA remains my top choice.

I look forward to being in touch, will understand any decisions either way, and hope you have a wonderful beginning to your day.

With appreciation,

Brett

[Personal cell/email](#)

On Apr 17, 2015, at 11:26 AM, Snyder, Brett
<Snyder.Brett@epa.gov> wrote:

Hi Brett:

Thanks for checking back and sharing your continued interest in NCEE. Our office is in the process of reviewing the student applications, as well as considering which projects proposed by our staff will be best suited for selected interns to work on this summer.

We don't want to hold up your own decision-

making process and have you rule out other viable and attractive options, and we realize that our own protracted process may result in our failing to move quickly enough to meet your own schedule and deadlines.

We want to be certain we have some meaningful work for the interns and ensure the staff overseeing the work are committed to their roles as engaged mentors for the interns. We met early this week to go over ideas and circulated information about you and the other students we've heard from this spring. I expect we will have reached final decisions and get clearance from our management to proceed to extend offers late next week, at which point we can share more news with you and the other applicants.

Not a definitive outcome on your prospects for a position with NCEE, but hope this helps provide a bit more information on where things stand on our end.

Sincerely,

Brett Snyder
USEPA, NCEE

From: Brett Cease
[mailto: **Personal cell/email**]
Sent: Friday, April 17, 2015 11:45 AM
To: Snyder, Brett
Subject: Re: FW: NCEE Summer Internship

Good Morning Brett,

I hope that this email finds you well. I wanted to touch base today to follow up and hear from you regarding my current status in the EPA's NCEE application process.

I want to communicate that a chance to work with NCEE is high among my possible internship sites and I am unsure whether I

should prioritize pursuing other opportunities available to me for this coming summer. I know how educational the chance to work within the NCEE would be and entirely understand if other applicants have been chosen to fill the summer internship positions or if the department is unable to accommodate an intern for the summer.

Thank you for the chance to meet over the phone and hear more about the important roles the NCEE is filling within the federal environmental/economic policy-making process. I considered our chance to talk and hear more about the program a true highlight of my early spring and I look forward to being in touch.

With many thanks,

Brett Cease

On Wed, Feb 25, 2015 at 9:52 AM, Snyder, Brett
<Snyder.Brett@epa.gov<<mailto:Snyder.Brett@epa.gov>>>
wrote:
Hi Brett –

Just wanted to be sure we got back to you to confirm receipt of the information and to applaud you on the good news of your acceptance to the fellowship program.

We are circulating your materials here in the office to ascertain whether we have some work that could be suitable for you to assist us with during your fellowship. Looking at your interests, there are also several other groups in our Office of Policy, as well as some of our program offices, who might serve as a suitable host for you, given your own experience and expressed interests in sustainability and community-related work. If you don't mind, I would like to share your materials with these other organizations, so as to increase your possible options here at the EPA?

Hope to be back in touch in the next week or two with more news. If you have other questions, please let us know.

Thanks again,

Brett Snyder
USEPA, NCEE
202-566-2261<tel:202-566-2261>

From: Brett Cease

Personal cell/email

Sent: Saturday, February 14, 2015 12:04 PM

To: Snyder, Brett

Subject: Re: NCEE Summer Internship

Brett,

Thank you once again for following up from our phone conversation earlier in January to provide such a comprehensive and incredibly helpful list of suggestions for possible environmental economic oriented internships in DC this coming summer.

I wanted to pass on the exciting news that I have indeed been accepted as an Archer Fellow and as a result I would love to apply to the NCEE division of the EPA for the chance to work under your division this summer.

I have included my cover letter and resume, detailing my areas of interest and prior background and experiences as you've requested. I will be happy to provide any additional information regarding specific interests for this summer's internship position as your department decides on what capacity you will have within the next month as the most recent NCEE posting I was able to find online was from 2009.

Additionally, thank you so much for all of the additional NGO and contract work

opportunities. I have bookmarked all of their sites and searched through their current employment opportunities. The only question I have is regarding the ORISE program. Within all of the wonderful internship positions I've seen posted, they all seem to indicate a minimum requirement of at least one year. Given that I will only be in DC from late May to late August, I am unsure whether I would qualify.

Should you have any questions, feel free to contact me via my email or phone number provided below. Thank you very much for your consideration and I look forward to being in touch.

With appreciation,

Brett Cease
Ph.D. student in Public Policy & Political
Economy
University of Texas at Dallas

Personal cell/email

On Sun, Jan 25, 2015 at 12:29 PM, Brett Cease

< > **Personal cell/email**

wrote:

Brett,

Thank you so much for remembering our conversation and taking the time to send such a detailed follow-up with the many exciting opportunities that exist to intern as an environmental economist this summer in DC.

I will be sure to get back to you with a much more detailed email containing my resume, cover letter, areas of experience, etc. in the week or two ahead, as soon as I hear back from my acceptance from the Archer Fellowship program here in the University of Texas system.

In the meantime though, I wanted to make sure

to pass on that I have received your kind email and look forward to being in touch.

With gratitude,

Brett Cease

On Wed, Jan 21, 2015 at 8:07 AM, Snyder, Brett

<Snyder.Brett@epa.gov<<mailto:Snyder.Brett@epa.gov>><<mailto:Snyder.Brett@epa.gov>>

wrote:

Hi Brett:

Thanks again for calling and it was nice to talk with you last week. We appreciate your expression of interest in a summer internship position with EPA's, National Center for Environmental Economics.

As I mentioned, we aren't certain if we can support any new paid summer student positions this coming year. That said, we will have a clearer picture about the state of our office's finances and our capacity to support any paid internships in February, and can be in touch with you then when we have more news to share. In the meantime, if you have information about yourself you want to provide to us – resume, indication of your areas of interest, classroom experience - we would be happy to receive and review the materials while we await news on our ability to support any paid or volunteer student internships.

We've also assembled some other information on a variety of organizations and programs that may offer employment opportunities for summer positions. While many of the links don't presently point to specific 2015 summer job openings, we hope they can serve as a useful resource in your search.

The primary link EPA hosts on its website concerning student positions is <http://www.epa.gov/careers/internships/index.html>. At present, many student internships are being

supported through EPA's participation in the ORISE program (<http://orise.orau.gov/epa/about-epa.htm>). This is one method EPA currently favors as a means to support paid student research positions. This program may turn out to be one of the primary ways EPA supports paid student positions this coming year - whether they be for the summer of 2015, or for longer periods of time (e.g., supporting students with part-time positions throughout the academic year). The program has tended to support post-graduate positions, but there have been occasions where positions for current undergraduate and graduate students are also advertised. Generally, participants are not required to hold U.S. citizenship. Any citizenship restrictions will be clearly stated in the project description, and information on eligibility requirements for non-U.S. citizens can be found in the Guidelines for Non-U.S. Citizens<<http://orise.orau.gov/epa/applicants/immigration.htm>>.

In addition, here is some other information on a few non-governmental organizations that perform work in the field of environmental economics – largely working under contract to EPA and other federal and/or private sector clients. They operate out of several cities, and most, though not all, have offices in the DC Metro area. They include (main page and careers pages):

- Abt Associates
(<http://www.abtassociates.com>);
<http://www.abtassociates.com/Careers-at-Abt/Current-Opportunities/Summer-Internship-Program.aspx>

- ICF International
(<http://www.icfi.com/default.asp>);
(<https://jobs.icfi.com/index.html>)

- Stratus Consulting
(<http://www.stratusconsulting.com>);
<http://stratusconsulting.com/careers/>)

- SAIC (<http://www.saic.com>);
<http://www.saic.com/about/join-us>,

- Cadmus Group
(<http://www.cadmusgroup.com>);
<http://www.cadmusgroup.com/careers>

- Research Triangle Institute (RTI)
International
(<http://www.rti.org><<http://www.rti.org>>);
<http://www.rti.org/page.cfm?nav=2>

- DPRA (<http://www.dpra.com>);
[http://www.dpra.com/about-](http://www.dpra.com/about-dpra/careersbenefits/)
[dpra/careersbenefits/](http://www.dpra.com/about-dpra/careersbenefits/)

- Industrial Economics (IEc)
(<http://www.indecon.com/>);
<http://www.indecon.com/iccweb/WorkingHere.aspx>

Last, there are several other EPA offices who are responsible for preparing economic analyses, and who have had occasion to support summer internship positions. We do not know whether they will have any resources to support paid student positions this coming summer, but you might want to keep them in mind as well. Some of these groups include (contact numbers from EPA telephone directory):

- Climate Economics Branch, Office of Air and Radiation - contact: [202-343-9436](tel:202-343-9436)<<tel:202-343-9436>><<tel:202-343-9436>><<tel:202-343-9436>>>

· Economic and Environmental Assessment
Branch, Office of Water – contact: 202-566-1002<tel:202-566-1002><tel:202-566-1002<tel:202-566-1002>>

· Economics and Policy Analysis Branch,
Office of Toxic Substances – contact: 202-564-8790<tel:202-564-8790><tel:202-564-8790<tel:202-564-8790>>

· Economics and Risk Analysis Staff,
Office of Solid Waste and Emergency
Response – contact: 703-308-8479<tel:703-308-8479><tel:703-308-8479<tel:703-308-8479>>*

· Economic Analysis Branch, Office of
Pesticide Programs – contact: 703-308-8150<tel:703-308-8150><tel:703-308-8150>*

· Air Economics Group, Office of Air and
Radiation – contact: 919-541-2864<tel:919-541-2864>**

The EPA main headquarters offices are primarily located in DC near the Federal Triangle metro station, but some EPA offices (*) are located in Virginia in the Potomac Yards commercial district, and one is located in Research Triangle Park, North Carolina (**).

Hope this proves helpful to you, and thanks again for showing interest in our office.

Brett Snyder
USEPA, NCEE

With appreciation,

Brett

Personal cell/email

"Not to believe in the possibility of dramatic change is to forget that things have changed, not enough, of course, but enough to show what is possible. We have been surprised before in history. We can be surprised again. We can do the surprising." -Howard Zinn

--

With appreciation,

Brett

Personal cell/email

"Not to believe in the possibility of dramatic change is to forget that things have changed, not enough, of course, but enough to show what is possible. We have been surprised before in history. We can be surprised again. We can do the surprising." -Howard Zinn

--

With appreciation,

Brett

Personal cell/email

"Not to believe in the possibility of dramatic change is to forget that things have changed, not enough, of course, but enough to show what is possible. We have been surprised before in history. We can be surprised

again. We can do the surprising." -Howard Zinn

--

With appreciation,

Brett

Personal cell/email

"Not to believe in the possibility of dramatic change is to forget that things have changed, not enough, of course, but enough to show what is possible. We have been surprised before in history. We can be surprised again. We can do the surprising." -Howard Zinn

--

With appreciation,

Brett

Personal cell/email

"Not to believe in the possibility of dramatic change is to forget that things have changed, not enough, of course, but enough to show what is possible. We have been surprised before in history. We can be surprised again. We can do the surprising." -Howard Zinn

--

With appreciation,

Brett

Personal cell/email

"Not to believe in the possibility of dramatic change is to forget that things have changed, not enough, of course, but enough to show what is possible. We have been surprised before in history. We can be surprised again. We can do the surprising." -Howard Zinn

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; ekopits
From: Kopits, Elizabeth
Sent: Fri 1/23/2015 10:55:47 AM
Subject: Fwd: current version of p. 1-17 with ek and ks comments
2015 01 22 SCC RTC - complete - ek ks alm.docx
ATT00001.htm

Personal cell/email

Sent from my iPhone

Begin forwarded message:

From: Alex Marten <marten.alex@epa.gov>
Date: January 22, 2015 at 9:15:56 PM EST
To: "Shouse, Kate" <Shouse.Kate@epa.gov>
Cc: "Kopits, Elizabeth" <Kopits.Elizabeth@epa.gov>, Alex Marten
<marten.alex@epa.gov>
Subject: Re: current version of p. 1-17 with ek and ks comments

The attached should have all three of our comments throughout the whole document. I made it all the way through today, but went light on the uncertainty considerations and scope sections. These both need to be pretty much rewritten due to tone and grammar and I don't have the constitution to do that tonight.

To OGC/OCIR: After 20 min of trying I couldn't get EPA remote email to work, hence I sent it from a different address cc'ing my EPA account to maintain the record on a government server.

On Thu, Jan 22, 2015 at 8:10 PM, Shouse, Kate <Shouse.Kate@epa.gov> wrote:

Thanks, that all sounds great to me.

Sent from my iPhone

On Jan 22, 2015, at 6:40 PM, "Marten, Alex" <Marten.Alex@epa.gov> wrote:

Let's use my call-in since I may work from home in the morning.

Conference code

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Kopits, Elizabeth
Sent: Thursday, January 22, 2015 4:38 PM
To: Shouse, Kate; Marten, Alex
Subject: RE: current version of p. 1-17 with ek and ks comments

Thanks, Kate! Alex said he will finish going through it (and try to add in our comments) and circulate by tomorrow. Then we can all be looking at the latest version when talking tomorrow. We all seem to be free anytime so want to tentatively say 10am?

Alex – Do you want to initiate a 3 way conference call? My cell is Personal cell/email
Personal cell/email and Kate's number is Personal cell/email

E.

From: Shouse, Kate
Sent: Thursday, January 22, 2015 4:12 PM
To: Kopits, Elizabeth; Marten, Alex
Subject: RE: current version of p. 1-17 with ek and ks comments

Hi – I'm almost through Jim's sections, just a couple more pages (I stopped after the first section on scenarios). I am going to try and wrap up my review of Jim's edits this evening but may need some more time tomorrow morning. I've attached my version to this message which I think includes all the edits from Elizabeth but may not (I copied over some material); best approach would be for me to add my comments/edits to the master once either or both of you are done with it.

I'm not sure if it will be useful for us to talk tomorrow. Mostly I wanted to make sure we had a chance to discuss the comments/edits but Elizabeth, if you've already discussed your concerns with Alex, we may not need to talk tomorrow. Let me know what you think and we can go from there. I'll be working at home and available at Personal cell/email

Thanks!

Kate

From: Kopits, Elizabeth
Sent: Thursday, January 22, 2015 1:20 PM
To: Shouse, Kate; Marten, Alex
Subject: RE: current version of p. 1-17 with ek and ks comments

Hi Alex,

I don't know if this is going to mess you up, but here are my comments on p. 17-25 (which is where it seems Jim left off). I am happy to hold off and add them myself to the version you send around next but just thought I'd send along now too.

Elizabeth

From: Shouse, Kate
Sent: Thursday, January 22, 2015 12:50 PM
To: Marten, Alex; Kopits, Elizabeth
Subject: RE: current version of p. 1-17 with ek and ks comments

No worries, you aren't holding me up – I'm still plugging away. Thanks for the update.

From: Marten, Alex
Sent: Thursday, January 22, 2015 12:45 PM
To: Shouse, Kate; Kopits, Elizabeth
Subject: RE: current version of p. 1-17 with ek and ks comments

I'm sorry Kate, I have only gotten through page 8 as of right now. It's taking me longer than expected and a fire drill thrown in this morning didn't help

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Shouse, Kate
Sent: Thursday, January 22, 2015 9:12 AM
To: Kopits, Elizabeth; Marten, Alex
Subject: RE: current version of p. 1-17 with ek and ks comments

Great, I'm planning to telework also, we can use my call in line. Alex, will you be available? Morning works well for me.

From: Kopits, Elizabeth
Sent: Thursday, January 22, 2015 9:10 AM
To: Shouse, Kate; Marten, Alex
Subject: RE: current version of p. 1-17 with ek and ks comments

I will be working at home tomorrow so yes I can do a call, preferably in the

morning.

From: Shouse, Kate
Sent: Thursday, January 22, 2015 9:08 AM
To: Kopits, Elizabeth; Marten, Alex
Subject: RE: current version of p. 1-17 with ek and ks comments

Thanks, Elizabeth. I'll review as well and add my comments on top of those from you and Alex whenever the master file is ready. I'll be able to work on this mid-day today and hopefully late afternoon. Will there be time for the three of us to discuss the comments/draft tomorrow? My calendar looks good tomorrow but I imagine yours is pretty full so I'll just stay tuned.

From: Kopits, Elizabeth
Sent: Thursday, January 22, 2015 8:29 AM
To: Marten, Alex
Cc: Shouse, Kate
Subject: RE: current version of p. 1-17 with ek and ks comments

Actually, maybe this is easier. Here is the complete current draft. It shows ek and ks comments through the Aggregation section (p.1-17) and is clean thereafter. I will start editing this from p. 18 on now, but Alex you are holding the pen, so I will just add my edits on top of whatever you send around next.

Hope I have not made this too confusing!!

From: Kopits, Elizabeth
Sent: Thursday, January 22, 2015 8:23 AM
To: Marten, Alex
Cc: Shouse, Kate
Subject: current version of p. 1-17 with ek and ks comments

Hi Alex,

I somehow messed up the merge, so all I have here is the current version of the first part – i.e., through the Aggregation section (p. 1-17). It shows comments and edits from both Kate and I. Maybe there is some way to append it to the remainder of the document that Jim sent last night? That would give us a complete current version.

Elizabeth

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Wolverton, Ann
Location: DCRoomWest4424G/OPEI
Importance: Normal
Subject: SAB call discussion
Start Date/Time: Wed 7/22/2015 4:30:00 PM
End Date/Time: Wed 7/22/2015 5:30:00 PM
[EWM teleconference summary 7-21-15.docx](#)
[2015 07 15 alm notes from ewm sab kickoff teleconference.pdf](#)

I thought it would be useful to discuss initial impressions based on the teleconference.

Please join if you can and feel free to bring your lunch.

Attached is a compilation of notes summarizing the call - the Word document is largely based on a combination of Holly and Brett's notes; the pdf is a list of questions from the panelists as recorded by Alex.

Call-in number:

Conference code

From: McGartland, Al
Location: Al's Conference Room - 202-566-2334
Importance: Normal
Subject: SCC Team Check Meeting - Elizabeth K.
Start Date/Time: Thur 7/23/2015 6:00:00 PM
End Date/Time: Thur 7/23/2015 6:45:00 PM

From: McGartland, Al
Location: Conference call: Dial Conference code Passcode Conference code
Importance: Normal
Subject: Fwd: SCC IWG conference call on response to comments
Categories: Record Saved - Shared
Start Date/Time: Fri 5/22/2015 5:00:00 PM
End Date/Time: Fri 5/22/2015 5:30:00 PM
[ATT00001.htm](#)

I can call into this. I can come into work if needed.

Non-Responsive

Sent from my iPhone

Begin forwarded message:

From: "Linn, Joshua" **EOP email/phone**
To: "Marten, Alex" <Marten.Alex@epa.gov>, "Sarofim, Marcus" <Sarofim.Marcus@epa.gov>, "Schwab, Margo" **EOP email/phone** "Kopits, Elizabeth" <Kopits.Elizabeth@epa.gov>, "Wolverton, Ann" <Wolverton.Ann@epa.gov>, "Newbold, Steve" <Newbold.Steve@epa.gov>, "Li, Jia" <Li.Jia@epa.gov>, "Shouse, Kate" <Shouse.Kate@epa.gov>, "Johansson, Robert - OCE" <RJohansson@oce.usda.gov>, "Thomas, Amanda" **EOP email/phone** "Griffiths, Charles" <Griffiths.Charles@epa.gov>, "Hodson, Elke" <Elke.Hodson@Hq.Doe.Gov>, "Arthur Rypinski@dot.gov" <Arthur.Rypinski@dot.gov>, "Mancini, Dominic J." **EOP email/phone** "Laity, Jim" **EOP email/phone** "Duke, Rick" **EOP email/phone** "Shelanski, Howard" **EOP email/phone** "Bruce D Rodan" **EOP email/phone** "Utech, Dan G." **EOP email/phone** "McConville, Drew" **EOP email/phone** "McGartland, Al" <McGartland.Al@epa.gov>, "Barron, Alex" <Barron.Alex@epa.gov>, "Gunning, Paul" <Gunning.Paul@epa.gov>, "Helper, Sue" <SHelper@doc.gov>, "Feather, Peter - OCE" <PFeather@oce.usda.gov>, "William.Hohenstein@usda.gov" <William.Hohenstein@usda.gov>, "Simon, Bob" **EOP email/phone** "Higgins, Cortney" **EOP email/phone** "Pershing, Jonathan" <Jonathan.Pershing@Hq.Doe.Gov>, "Obstfeld, Maurice" **EOP email/phone** "Goldstein, Jeff" **EOP email/phone** "mon, Benjamin" <benjamin_simon@ios.doi.gov>, "Beauvais, Joel" <Beauvais.Joel@epa.gov>, "Down, Adrian (FELLOW)" <Adrian.Down@Hq.Doe.Gov>, "Nye, Joseph" **EOP email/phone** "Mallory, Brenda" **EOP email/phone** "Gruenspecht, Howard" <Howard.Gruenspecht@eia.gov>, "Adam Stern" <adam_stern@ios.doi.gov>, "Christian Crowley" <christian_crowley@ios.doi.gov>, "Bergman, Aaron" **EOP email/phone**
Subject: SCC IWG conference call on response to comments

Dear Members of the SCC IWG:

Apologies for the late notice and proximity to the holiday weekend, but we'd like to hold a conference call to discuss the status of the Response to Comments. The call will take place 1-1:30pm on Friday May 22. The call-in information is:

Bridge Number	Conference code
Conferee Passcode	Conference code

Hope you can make it, and please let me know if you can't and would like to follow up separately.

Josh

To: Bowen, Jennifer[Bowen.Jennifer@epa.gov]; Dockins, Chris[Dockins.Chris@epa.gov]; Evans, DavidA[Evans.DavidA@epa.gov]; Ferris, Ann[Ferris.Ann@epa.gov]; Garbaccio, Richard[Garbaccio.Richard@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Klemick, Heather[Klemick.Heather@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; McGartland, Al[McGartland.Al@epa.gov]; Moore, Chris[Moore.Chris@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Pasurka, Carl[Pasurka.Carl@epa.gov]; Sargent, Keith[Sargent.Keith@epa.gov]; Shadbegian, Ron[Shadbegian.Ron@epa.gov]; Sheriff, Glenn[Sheriff.Glenn@epa.gov]; Simon, Nathalie[Simon.Nathalie@epa.gov]; Simpson, David[Simpson.David@epa.gov]; Snyder, Brett[Snyder.Brett@epa.gov]
From: Wolverton, Ann
Sent: Mon 3/23/2015 3:37:26 PM
Subject: RE: additional agenda items for today? Plus call-in info

Sorry – plus NAS SCC update.

From: Wolverton, Ann
Sent: Monday, March 23, 2015 11:37 AM
To: Bowen, Jennifer; Dockins, Chris; Evans, DavidA; Ferris, Ann; Garbaccio, Richard; Griffiths, Charles; Klemick, Heather; Kopits, Elizabeth; Marten, Alex; McGartland, Al; Moore, Chris; Newbold, Steve; Pasurka, Carl; Sargent, Keith; Shadbegian, Ron; Sheriff, Glenn; Simon, Nathalie; Simpson, David; Snyder, Brett
Subject: additional agenda items for today? Plus call-in info

Hi all,

Let me know if you want to add anything to the agenda for today's climate meeting.

So far, I have:

Rule updates (as needed):

Non-Responsive

Non-Responsive

Other:

Non-Responsive

Dave, are you still planning to call in? Anyone else?

We can use the free conference line: **Conference code**

Conference extension: **Conference code**

Participant code: **Conference code**

To: Barron, Alex[Barron.Alex@epa.gov]
From: Kopits, Elizabeth
Sent: Sat 1/24/2015 1:46:17 AM
Subject: Re: Thanks

Thanks for your very nice note, Alex. I am only sorry I am leaving so much scc/scm stuff on everyone's plate right now! But I know that Alex and Kate and the rest of the crew will carry it forward impeccably while I am out.

I hope to send some healthy happy baby news by late Monday!

Best,
Elizabeth

Sent from my iPhone

On Jan 23, 2015, at 1:20 PM, "Barron, Alex" <Barron.Alex@epa.gov> wrote:

Elizabeth – I don't know exactly when you are officially starting leave, but I just wanted to write to say thank you for your fantastic work (both in the run up to leave, and more generally). You've been doing great work keeping the SCC and other projects on track and

Non-Responsive

Thanks and best wishes,

Alex

Alex Barron, Ph.D.

Deputy Associate Administrator

Office of Policy

U.S. Environmental Protection Agency

202-564-3304

To: Marten, Alex[Marten.Alex@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
From: Durham, Natalie
Sent: Tue 7/21/2015 7:32:13 PM
Subject: RE: SCC Meeting with Kevin

That seems to be the best time for everyone. I am waiting for an ok from Al. I may have Janet pencil it in on the calendar anyway.

Natalie Durham

Environmental Protection Agency

National Center for Environmental Economics

1200 Pennsylvania Avenue NW

Washington, DC 20460

202-566-2289

Durham.natalie@epa.gov

From: Marten, Alex
Sent: Tuesday, July 21, 2015 3:00 PM
To: Wolverton, Ann; Durham, Natalie; Kopits, Elizabeth; Newbold, Steve; Griffiths, Charles
Subject: RE: SCC Meeting with Kevin

Then maybe Mon 7/27 from 3:30-4:30 would be the best time.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Wolverton, Ann
Sent: Tuesday, July 21, 2015 2:59 PM
To: Durham, Natalie; Kopits, Elizabeth; Newbold, Steve; Marten, Alex; Griffiths, Charles
Subject: RE: SCC Meeting with Kevin

For the 23rd, right now there is a climate team meeting from 1 – 2 pm on the 23rd and a SCC NAS update for staff from 2- 2:30 pm. I leave at 4:30 so I cannot make a 4 – 5 time slot.

For the 27th, I can make a meeting that is in the 3- 4:30 pm timeframe. This would be my preference.

I am not in on Wednesday, the 29th.

Ann

From: Durham, Natalie
Sent: Tuesday, July 21, 2015 2:50 PM
To: Wolverton, Ann; Kopits, Elizabeth; Newbold, Steve; Marten, Alex; Griffiths, Charles
Subject: SCC Meeting with Kevin

Hi everyone,

Please see the dates and time Kevin's scheduler submitted to me for his SCC with everyone on this email. Please let me know your availability. July 29th Al has a Non-Responsive meeting at 2:00 – 4:00 Al will not be available on 7/29 2:30-3:30 time schedule. Thanks everyone.

Kevin is available:

Thursday 23rd from 1 – 3 & 4 – 5

Monday 27th from 3 – 5

Wed. 29th from 11 – 12 & 2:30 – 3:30

Natalie Durham

Environmental Protection Agency

National Center for Environmental Economics

1200 Pennsylvania Avenue NW

Washington, DC 20460

202-566-2289

Durham.natalie@epa.gov

To: Marten, Alex[Marten.Alex@epa.gov]
Cc: Wolverton, Ann[Wolverton.Ann@epa.gov]; Durham, Natalie[Durham.Natalie@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 7/21/2015 7:00:49 PM
Subject: Re: SCC Meeting with Kevin

Great for me

Sent from my iPhone

On Jul 21, 2015, at 3:00 PM, "Marten, Alex" <Marten.Alex@epa.gov> wrote:

<image001.gif>

Then maybe Mon 7/27 from 3:30-4:30 would be the best time.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Wolverton, Ann
Sent: Tuesday, July 21, 2015 2:59 PM
To: Durham, Natalie; Kopits, Elizabeth; Newbold, Steve; Marten, Alex; Griffiths, Charles
Subject: RE: SCC Meeting with Kevin

For the 23rd, right now there is a climate team meeting from 1 – 2 pm on the 23rd and a SCC NAS update for staff from 2- 2:30 pm. I leave at 4:30 so I cannot make a 4 – 5 time slot.

For the 27th, I can make a meeting that is in the 3- 4:30 pm timeframe. This would be my preference.

I am not in on Wednesday, the 29th.

Ann

From: Durham, Natalie
Sent: Tuesday, July 21, 2015 2:50 PM
To: Wolverton, Ann; Kopits, Elizabeth; Newbold, Steve; Marten, Alex; Griffiths, Charles
Subject: SCC Meeting with Kevin

Hi everyone,

Please see the dates and time Kevin's scheduler submitted to me for his SCC with everyone on this email. Please let me know your availability. July 29th Al has a **Non-Responsive** Quarterly meeting at 2:00 – 4:00 Al will not be available on 7/29 2:30-3:30 time schedule. Thanks everyone.

Kevin is available:

Thursday 23rd from 1 – 3 & 4 – 5

Monday 27th from 3 – 5

Wed. 29th from 11 – 12 & 2:30 – 3:30

Natalie Durham

Environmental Protection Agency

National Center for Environmental Economics

1200 Pennsylvania Avenue NW

Washington, DC 20460

202-566-2289

Durham.natalie@epa.gov

To: Marten, Alex[Marten.Alex@epa.gov]
Cc: Durham, Natalie[Durham.Natalie@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Newbold, Steve[Newbold.Steve@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]
From: Kopits, Elizabeth
Sent: Tue 7/21/2015 6:56:42 PM
Subject: Re: SCC Meeting with Kevin

I am unavailable during the times on 7/23. If it works for everyone I think 7/27 would be best since we are due to have an SCC discussion with Joel on 7/28. I have no preference within the 3-5 pm range.

Thanks,
Elizabeth

Sent from my iPhone

On Jul 21, 2015, at 2:53 PM, "Marten, Alex" <Marten.Alex@epa.gov> wrote:

<image002.gif>

I can make any of those work, but would have a preference for avoiding Wed 11-12.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Durham, Natalie
Sent: Tuesday, July 21, 2015 2:50 PM
To: Wolverton, Ann; Kopits, Elizabeth; Newbold, Steve; Marten, Alex; Griffiths, Charles
Subject: SCC Meeting with Kevin

Hi everyone,

Please see the dates and time Kevin's scheduler submitted to me for his SCC with everyone on this email. Please let me know your availability. July 29th Al has a Non-Responsive Quarterly meeting at 2:00 – 4:00 Al will not be available on 7/29 2:30-3:30 time schedule.
Thanks everyone.

Kevin is available:

Thursday 23rd from 1 – 3 & 4 – 5

Monday 27th from 3 – 5

Wed. 29th from 11 – 12 & 2:30 – 3:30

Natalie Durham

Environmental Protection Agency

National Center for Environmental Economics

1200 Pennsylvania Avenue NW

Washington, DC 20460

202-566-2289

Durham.natalie@epa.gov

To: Beauvais, Joel[Beauvais.Joel@epa.gov]
Cc: Bowen, Jennifer[Bowen.Jennifer@epa.gov]; McGartland, Al[McGartland.Al@epa.gov]; Wolverton, Ann[Wolverton.Ann@epa.gov]; Dockins, Chris[Dockins.Chris@epa.gov]; Axelrad, Daniel[Axelrad.Daniel@epa.gov]; Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]; Morgan, Cynthia[Morgan.Cynthia@epa.gov]; Jenkins, Robin[Jenkins.Robin@epa.gov]; Simpson, David[Simpson.David@epa.gov]; Snyder, Brett[Snyder.Brett@epa.gov]; Maguire, Kelly[Maguire.Kelly@epa.gov]; Kenny, Shannon[Kenny.Shannon@epa.gov]; Roberts, Martha[Roberts.Martha@epa.gov]; Kime, Robin[Kime.Robin@epa.gov]; Durham, Natalie[Durham.Natalie@epa.gov]; Rennert, Kevin[Rennert.Kevin@epa.gov]; Guignet, Dennis[Guignet.Dennis@epa.gov]; Ferris, Ann[Ferris.Ann@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]; Evans, DavidA[Evans.DavidA@epa.gov]
From: Simon, Nathalie
Sent: Tue 7/14/2015 3:50:30 PM
Subject: Proposed Agenda for today's NCEE Update meeting

Hi Joel—

Below is our proposed agenda for this afternoon's NCEE Update meeting. Please let us know if there are other topics you wish to discuss.

Thanks!
Nathalie

Proposed Agenda for NCEE Update

Tuesday July 14th

Non-Responsive

4. SCC-NAS Update

Non-Responsive

Non-Responsive

To: Hubbell, Bryan[Hubbell.Bryan@epa.gov]; Evans, DavidA[Evans.DavidA@epa.gov]
Cc: Shouse, Kate[Shouse.Kate@epa.gov]; Marten, Alex[Marten.Alex@epa.gov]
From: Macpherson, Alex
Sent: Tue 7/14/2015 4:25:38 PM
Subject: RE: Comment on 4A

OK. Thanks Bryan. Will do.

Alex

From: Hubbell, Bryan
Sent: Tuesday, July 14, 2015 12:17 PM
To: Evans, DavidA; Macpherson, Alex
Cc: Shouse, Kate; Marten, Alex
Subject: RE: Comment on 4A

Dave-

I have addressed and removed most of your comments in Chapter 4— Alex, there are a couple of remaining comments that you need to address, please.

Non-Responsive

Thanks!

Bryan

From: Evans, DavidA
Sent: Monday, July 13, 2015 5:12 PM

To: Macpherson, Alex; Hubbell, Bryan
Cc: Shouse, Kate; Marten, Alex
Subject: RE: Comment on 4A

Alex and Bryan,

I'm finished with comments/edits on 4. It looks very good.

Kate, I found a use of SCC that I changed to SC-CO2 in section 4.4

D

From: Evans, DavidA
Sent: Monday, July 13, 2015 4:45 PM
To: Macpherson, Alex; Hubbell, Bryan
Subject: Comment on 4A

I'm finished with my comments on appendix 4A. Turning to 4 now.

Bryan, call me if you have any questions: 202 566 2358

(I meant to send this email over an hour ago. I'm already almost finished with 4....)

d

To: Marten, Alex[Marten.Alex@epa.gov]
Cc: CurryBrown, Amanda[CurryBrown.amanda@epa.gov]; Risley, David[Risley.David@epa.gov]
From: Shouse, Kate
Sent: Mon 7/13/2015 8:27:43 PM
Subject: RE: 111 b RIA

Thanks, Alex.

Amanda or David, are you able to add "id" to RIA Ch 3, first paragraph? You'll see the sentence flagged with Alex Marten's question. Thx!

From: Marten, Alex
Sent: Monday, July 13, 2015 4:26 PM
To: Shouse, Kate
Subject: FW: 111 b RIA

Kate, that works for me.

--

Alex L. Marten
phone: (202) 566-2301
email: marten.alex@epa.gov

From: Silverman, Steven
Sent: Monday, July 13, 2015 4:25 PM
To: Shouse, Kate
Cc: Marten, Alex; CurryBrown, Amanda; Kopits, Elizabeth
Subject: RE: 111 b RIA

Just put 'id.' it's from that same preamble section

From: Shouse, Kate
Sent: Monday, July 13, 2015 4:07 PM
To: Silverman, Steven
Cc: Marten, Alex; CurryBrown, Amanda; Kopits, Elizabeth
Subject: RE: 111 b RIA

Yep ☺

Thanks, Steve. One outstanding question – do you have citations for the bolded part below?
This was text that you had suggested adding to RIA Ch 3 Intro (pg 3-1) and OP asked if could cross-reference examples in the preamble or provide direct citations.

Non-Responsive

From: Silverman, Steven
Sent: Monday, July 13, 2015 3:52 PM
To: Shouse, Kate
Cc: Marten, Alex; CurryBrown, Amanda; Kopits, Elizabeth
Subject: RE: 111 b RIA

I am fine with all the edits from you guys, who I assume acted in ensemble

From: Shouse, Kate
Sent: Monday, July 13, 2015 2:53 PM
To: Silverman, Steven
Cc: Marten, Alex; CurryBrown, Amanda; Kopits, Elizabeth
Subject: RE: 111 b RIA

Hi, Steve. We've responded to your comments on SCC in the 111(b) RIA (Section 3.2). Will you be able to review and let us know if you agree by 4 pm today? OAQPS is working to send the RIA to OMB today.

There's also a question for you on pg 3-1 in the intro paragraph.

Thanks,
Kate

From: Silverman, Steven
Sent: Monday, July 13, 2015 9:02 AM
To: Shouse, Kate
Subject: FW: 111 b RIA

I put in some cmmts on SCC section as well

From: Silverman, Steven
Sent: Sunday, July 12, 2015 4:21 PM
To: CurryBrown, Amanda; Evans, DavidA; Elman, Barry; Roberts, Martha; Hutson, Nick; Fellner, Christian
Cc: Marks, Matthew; Hoffman, Howard
Subject: 111 b RIA

I have been thru RIA and put cmmts into the sharepoint version (should show up in bold). Nick, please check text at n 44 and p 4-22 to update to reflect latest NETL.

Please check table 4-5, which looks funky (and doesn't appear to use \$ KWh for LCOE)

Check discussion of **Non-Responsive**

I did not look at ch 6 (NGCC)

Barry/Martha, material at p 5-20 might be of help on **Non-Responsive**

Non-Responsive

Non-Responsive However, please give a glance.

To: McGartland, Al[McGartland.Al@epa.gov]
Cc: Marten, Alex[Marten.Alex@epa.gov]
From: Evans, DavidA
Sent: Thur 2/19/2015 4:44:34 PM
Subject: RE: RIA convo with Joel - Prep
2015 02 19 notes for ria convo with Joel v2.docx

Al,

Here are our notes for Joel per my email below. Look forward to your comments.

Dave

From: Evans, DavidA
Sent: Thursday, February 19, 2015 10:31 AM
To: McGartland, Al
Cc: Marten, Alex
Subject: RIA convo with Joel - Prep

Al,

Just a quick update on the 4pm convo with Joel: Alex and I are nearly finished with the two pager and should get it to you by noon. Hopefully you will have time after your 11am meeting to review. Alex and I both have meetings starting at 1:30. I can skip the climate team meeting at 2, however, if need be, to respond to any comments you have. Alex and I have a 3pm w/ Alex prior to the 4pm w/ Joel.

We fleshed out the 2 pager more than the version we provided you. We did so in response to Joel's growing interest in having paper to walk away with.

The purpose of the meeting is to refamiliarize Joel with the content of the RIAs at proposal, the plan for the RIA's going forward, and remind him of major and minor issues. If we can get his guidance on how to proceed on specific issues, for which we don't already have guidance, that is preferable, but not necessary at this time. We can revisit issues during our weekly updates with him.

Dave

From: Evans, DavidA
Sent: Friday, February 13, 2015 12:07 PM
To: McGartland, Al
Cc: Marten, Alex
Subject: RIA convo with Joel - Prep

Hi Al,

For the RIA convo discussion with Joel on Tuesday, Alex and I were thinking we would have a 1 to 2 page bullet list to walk Joel through. We would lead with issues where we feel we need to understand; **Non-Responsive** All of these issues we discussed with you already. The list would include items you raised in our meetings. It would

Non-Responsive

It would also have an outline of the chapters for both of the RIAs.

You can imagine it as similar to the list we walked you through, but with the order reversed (i.e., issues then outline).

Does that sound like a good plan? Alex and I would have a draft to you by the end of today. I may also have some draft notes for us (NCEE) that are a little more detailed just to make sure we hit more of the high points during the briefing. Sorry if we can't remember more specific guidance from you when we last spoke.

In terms of presentation, the plan is for me to take the lead introducing topics and keeping time, with Alex and you (and whomever) chiming in as appropriate. Of course, Alex and I can reverse our roles on the presentation w/ ease if need be.

Dave

To: Ganguli, Swarupa[Ganguli.Swarupa@epa.gov]
Cc: Cappel, Kirsten[Cappel.Kirsten@epa.gov]; Bowen, Jennifer[Bowen.Jennifer@epa.gov]; Snyder, Brett[Snyder.Brett@epa.gov]
From: Kopits, Elizabeth
Sent: Thur 7/9/2015 8:12:15 PM
Subject: RE: update on plan for LFGcost model peer review
[Science Inventory - Record Report.pdf](#)
[2014 11 06 SC-CH4 application white paper peer review information CLEAN.docx](#)

Hi Swarupa,

Sounds good.

Here is the information I put together for our recent review on methane as well as a copy of the peer review plan we needed to post on the EPA science inventory website. Obviously these will need to be adapted a bit

Non-Responsive

Non-Responsive

Best,

Elizabeth

From: Ganguli, Swarupa
Sent: Thursday, July 09, 2015 3:58 PM
To: Kopits, Elizabeth
Cc: McGartland, Al; Snyder, Brett; Bowen, Jennifer; Cappel, Kirsten
Subject: RE: update on plan for LFGcost model peer review

Hi Elizabeth,

Non-Responsive

I look forward to working with you. Please feel free to send any materials you prepared on your recent review.

Best,

Ms.Swarupa Ganguli

Team Lead, Municipal Solid Waste

Landfill Methane Outreach Program/Global Methane Initiative

Climate Change Division

US Environmental Protection Agency

Phone: 202-343-9732

Office: William Jefferson Clinton Building

1201 Constitution Avenue, N.W.

Room 4353 GG

Washington, DC 20004

Maii Code:USEPA Headquarters

William Jefferson Clinton Building

1200 Pennsylvania Avenue, N.W. (6207 M)

Washington, DC 20460



From: Kopits, Elizabeth
Sent: Thursday, July 09, 2015 3:44 PM
To: Ganguli, Swarupa
Cc: McGartland, Al; Snyder, Brett; Bowen, Jennifer
Subject: update on plan for LFGcost model peer review

Hi Swarupa,

Non-Responsive

Please let me know if I'm forgetting anything.

Best,

Elizabeth

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Michaud,Christian [NCR]
Sent: Wed 7/15/2015 2:13:05 PM
Subject: RE: Social Cost of Carbon/Methane Update

Hi Elizabeth,

Next Wednesday at 10-10:30AM sounds good for us. We do have a conference call line. Here is the call-in info:

Dial-in number: **Conference code**

Conference ID: **Conference code**

Thanks,

Christian Michaud

819-956-5146

From: Kopits, Elizabeth [mailto:Kopits.Elizabeth@epa.gov]
Sent: July 15, 2015 9:13 AM
To: Michaud,Christian [NCR]
Subject: RE: Social Cost of Carbon/Methane Update

Hi Christian,

Let's say 10-10:30AM next Wednesday the 22nd. I think it might be easiest for us to use a conference call line because my boss, Al McGartland, will likely be joining as well and I will likely be working remotely that day. If you don't have one handy, I am happy to send a call-in number we can use.

Thanks,

Elizabeth

From: Michaud,Christian [NCR] [<mailto:Christian.Michaud@ec.gc.ca>]
Sent: Tuesday, July 14, 2015 4:12 PM
To: Kopits, Elizabeth
Subject: RE: Social Cost of Carbon/Methane Update

Hi Elizabeth,

Thank you very much for your quick response.

I hadn't seen the OMB blog on the update, but I have learned through other news outlets about the response to public comments, revisions to the TSD as well as the NAS peer-review process. I have reviewed the updated Technical Update paper and shared the information with my Chris and Warren, so we do have an understanding of what was changed in the methodology. With that said, I will review the post of the blog to ensure that I didn't miss anything on this.

As for timing of the call, it seems like all of us would be available on Wednesday the 22nd between 10 AM and 11 AM, and Thursday the 23rd between 1 PM and 2 PM. Would there be a half-hour time slot that would work for you at those times?

Best regards,

Christian Michaud

819-956-5146

From: Kopits, Elizabeth [<mailto:Kopits.Elizabeth@epa.gov>]

Sent: July 14, 2015 4:00 PM
To: Michaud,Christian [NCR]
Subject: Re: Social Cost of Carbon/Methane Update

Hi Christian,

Yes I would happy to talk any time. Next week either Wednesday or Thursday would be best. This week would be fine too.

In the meantime have you seen the 7/2 OMB blog post on SCC? It summarizes the latest developments and provides links to the new files.

Please feel free to suggest a couple of times that might work on your end. Looking forward to speaking soon.

Regards,

Elizabeth

Sent from my iPhone

On Jul 14, 2015, at 3:40 PM, "Michaud,Christian [NCR]" <Christian.Michaud@ec.gc.ca> wrote:

Hello Elizabeth,

My name is Christian Michaud from the Economic Analysis Directorate at Environment Canada. Previously, I worked under John Cuddihy, who was in touch with you about developments around the Social Cost of Carbon. As he left on an assignment recently, I've been asked to take over the lead on this file.

Recently, we have seen quite a few developments around the SCCO2 and SCCH4, and were wondering whether it would be possible for my new director, Warren Goodlet, my manager,

Chris Adams, and myself to have a quick chat with you sometime next week in order to have a better understanding of what might be expected in the next few months on those files.

Please let me know if that would work for you.

Best regards,

Christian Michaud

Economist | Économiste

Economic Analysis Directorate | Direction de l'analyse économique

Strategic Policy Branch | Direction générale de la politique stratégique

Environment Canada | Environnement Canada

10, rue Wellington

Gatineau QC K1A 0H3

Christian.Michaud@ec.gc.ca

Telephone | Téléphone 819-956-5146

Facsimile | Télécopieur 819-953-3241

Government of Canada | Gouvernement du Canada

Website | Site Web www.ec.gc.ca

To: Kopits, Elizabeth[Kopits.Elizabeth@epa.gov]
From: Durham, Natalie
Sent: Wed 7/15/2015 1:33:41 PM
Subject: RE: scheduling call on SCC for next Wednesday, 7/22, 10-10:30AM

Yes, also the pin is Conference code Thanks

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 9:32 AM
To: Durham, Natalie
Subject: RE: scheduling call on SCC for next Wednesday, 7/22, 10-10:30AM

Thanks for scheduling the meeting. Is it on Al's calendar now too? I only saw you and me as attendees.

Thanks,

Elizabeth

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 9:21 AM
To: Durham, Natalie
Cc: McGartland, Al
Subject: scheduling call on SCC for next Wednesday, 7/22, 10-10:30AM

Hi Natalie,

Can you add an invite to Al's calendar for 10-10:30AM next Wednesday the 22nd entitled 'call with Environment Canada on SCC'? See email chain below for background. It will just be him and me joining the meeting. Also, can we use Al's conference call-in info if needed? Can you send it to me so that I can initiate the call?

Non-Responsive

Thanks!

Elizabeth

From: Kopits, Elizabeth
Sent: Wednesday, July 15, 2015 9:08 AM
To: McGartland, Al
Subject: RE: Social Cost of Carbon/Methane Update

Ok sounds good. Thanks!

From: McGartland, Al
Sent: Wednesday, July 15, 2015 9:07 AM
To: Kopits, Elizabeth
Subject: Re: Social Cost of Carbon/Methane Update

I think I can make either time. All the conflicts are internal meetings that can be moved.

I don't think we need to involve Kevin. We can let them know it's scheduled. And if by chance I can't make it in fine with you doing this without me.

Sent from my iPhone

On Jul 15, 2015, at 7:42 AM, Kopits, Elizabeth <Kopits.Elizabeth@epa.gov> wrote:

Hi Al,

Ex 5

You currently have conflicts with both of time slots they have suggested below, but if you would like to join please let me know and I can suggest some other times to them.

Thanks,

Elizabeth

From: Michaud,Christian [NCR] [<mailto:Christian.Michaud@ec.gc.ca>]

Sent: Tuesday, July 14, 2015 4:12 PM

To: Kopits, Elizabeth

Subject: RE: Social Cost of Carbon/Methane Update

Hi Elizabeth,

Thank you very much for your quick response.

I hadn't seen the OMB blog on the update, but I have learned through other news outlets about the response to public comments, revisions to the TSD as well as the NAS peer-review process. I have reviewed the updated Technical Update paper and shared the information with my Chris and Warren, so we do have an understanding of what was changed in the methodology. With that said, I will review the post of the blog to ensure that I didn't miss anything on this.

As for timing of the call, it seems like all of us would be available on Wednesday the 22nd between 10 AM and 11 AM, and Thursday the 23rd between 1 PM and 2 PM. Would there be a half-hour time slot that would work for you at those times?

Best regards,

Christian Michaud

819-956-5146

From: Kopits, Elizabeth [<mailto:Kopits.Elizabeth@epa.gov>]
Sent: July 14, 2015 4:00 PM
To: Michaud,Christian [NCR]
Subject: Re: Social Cost of Carbon/Methane Update

Hi Christian,

Yes I would happy to talk any time. Next week either Wednesday or Thursday would be best. This week would be fine too.

In the meantime have you seen the 7/2 OMB blog post on SCC? It summarizes the latest developments and provides links to the new files.

Please feel free to suggest a couple of times that might work on your end. Looking forward to speaking soon.

Regards,

Elizabeth

Sent from my iPhone

On Jul 14, 2015, at 3:40 PM, "Michaud,Christian [NCR]" <Christian.Michaud@ec.gc.ca> wrote:

Hello Elizabeth,

My name is Christian Michaud from the Economic Analysis Directorate at Environment Canada. Previously, I worked under John Cuddihy, who was in touch with you about developments around the Social Cost of Carbon. As he left on an assignment recently, I've been asked to take over the lead on this file.

Recently, we have seen quite a few developments around the SCCO₂ and SCCH₄, and were wondering whether it would be possible for my new director, Warren Goodlet, my manager, Chris Adams, and myself to have a quick chat with you sometime next week in order to have a better understanding of what might be expected in the next few months on those files.

Please let me know if that would work for you.

Best regards,

Christian Michaud

Economist | Économiste

Economic Analysis Directorate | Direction de l'analyse économique

Strategic Policy Branch | Direction générale de la politique stratégique

Environment Canada | Environnement Canada

10, rue Wellington

Gatineau QC K1A 0H3

Christian.Michaud@ec.gc.ca

Telephone | Téléphone 819-956-5146

Facsimile | Télécopieur 819-953-3241

Government of Canada | Gouvernement du Canada

Website | Site Web www.ec.gc.ca

Are the Non-Monetary Costs of Energy Efficiency Investments Large? Understanding Low Take-up of a Free Energy Efficiency Program[†]

By Meredith Fowlie, Michael Greenstone, and Catherine Wolfram*

This paper finds striking evidence that in private benefits notwithstanding, a very small fraction of income-eligible families apply for energy efficiency improvements that require zero weatherization assistance. An even smaller fraction of eligible households actually receive it, and even fewer households are believed to be privately beneficial. We report the low participation rates raise questions about results from a large-scale randomized controlled trial that significantly reduced barriers to participation in the Federal Weatherization Assistance Program (WAP). This program, the largest residential energy efficiency program in the country, aims to reduce the energy burden of low-income households by installing energy efficiency measures in their homes. Since the program's inception in 1976, more than 7 million households have received weatherization assistance.

Related work (Fowlie, Greenstone, and Wolfram 2015) finds that participation in this program significantly reduces energy consumption—and associated energy expenditures—among participating households. These sizeable

I. The Weatherization Assistance Program

*Fowlie: UC Berkeley, 207 Giannini Hall, Berkeley, CA 94720, and NBER (e-mail: fowlie@berkeley.edu)
 Greenstone: University of Chicago, 1126 East 59th Street, Chicago, Illinois 60637, and NBER (e-mail: mgreenst@uchicago.edu)
 Wolfram: UC Berkeley, Student Services Building, S545, Berkeley, CA 94720, and NBER (e-mail: cwolfram@berkeley.edu)

The authors gratefully acknowledge financial support from the Alfred P. Sloan Foundation, the Rockefeller Foundation, the UC Berkeley Energy and Climate Initiative, and institutional support from the Poverty Action Lab (JPAL), the Center for Local, State, and Urban Policy (CLOSUP) at the University of Michigan, and the Energy Institute at Haas. We thank James Gillan, Walter Graf, Eric Myers, Dan Stuart, Matthew Woerman, and Jesse Walker for excellent research and project management assistance.

[†] Go to <http://dx.doi.org/10.1257/aer.p20151011> to visit the article page for additional materials and author disclosure statements.

¹ Our estimates of the net present value of energy savings (valued using retail energy prices) range from \$1,500 to over \$3,600, depending on assumptions about the lifespan of the investment and the relevant discount rate. These savings appear to be substantially smaller than the costs of the energy efficiency investments (Fowlie, Greenstone, and Wolfram 2015).

The Weatherization Assistance Program provides free energy efficiency improvements to low-income households. Federal support for this program increased significantly under the American Reinvestment and Recovery Act (ARRA). Our study was conducted in Michigan during the ARRA-funded period.

Participating households receive a free energy audit and a home retrofit that typically includes some combination of insulation, window replacements, furnace replacement, and infiltration reduction. The average value of the efficiency retrofits provided to participating households in our study approximately \$5,000 per home.

Although households incur no direct monetary costs to participate, the process of applying for weatherization is onerous and time intensive, at least partially to prevent fraud. Applicants must submit extensive paperwork documenting

Do Energy Efficiency Investments Deliver? Evidence from the Weatherization Assistance Program

Meredith Fowlie, Michael Greenstone, and Catherine Wolfram*

June 2015

Abstract

Conventional wisdom suggests that energy efficiency (EE) policies are beneficial because they induce investments that pay for themselves and lead to emissions reductions. However, this belief is primarily based on projections from engineering models. This paper reports on the results of an experimental evaluation of the nation's largest residential EE program conducted on a sample of more than 30,000 households. The findings suggest that the upfront investment costs are about twice the actual energy savings. Further, the model-projected savings are roughly 2.5 times the actual savings. While this might be attributed to the "rebound" effect—when demand for energy end uses increases as a result of greater efficiency—the paper fails to find evidence of significantly higher indoor temperatures at weatherized homes. Even when accounting for the broader societal benefits of energy efficiency investments, the costs still substantially outweigh the benefits; the average rate of return is approximately -9.5% annually.

* We received many helpful comments from seminar participants at Carnegie Mellon, Columbia University, ETH Zurich, National University of Singapore, NBER Summer Institute, Resources for the Future, the University of Basel, the University of Maryland, the University of Michigan, and the University of Wisconsin. The authors gratefully acknowledge the financial support of the Alfred P. Sloan Foundation, the MacArthur Foundation, the Rockefeller Foundation and the UC Berkeley Energy and Climate Institute, and institutional support from the Poverty Action Lab (JPAL) at MIT, the Center for Local, State, and Urban Policy (CLOSUP) at the University of Michigan, and the Energy Institute at Haas. We thank James Gillan, Brian Goggin, Walter Graf, Erica Myers, Daniel Stuart, and Matthew Woerman for excellent research assistance. We are indebted to Jesse Worker for outstanding management of a challenging project. Finally, we thank our contacts at both our partner utility and the community action agencies, without whom this project would not have been possible.

Should Governments Use a Declining Discount Rate in Project Analysis?

Kenneth J. Arrow^{*}, Maureen L. Cropper^y, Christian Gollier^z,
Ben Groom[§], Geoffrey M. Heal^{ffi}, Richard G. Newell^k,
William D. Nordhaus[#], Robert S. Pindyck^{**}, William A. Pizer^{yy},
Paul R. Portney^{zz}, Thomas Sterner^{§§}, Richard S. J. Tol^{ffifi}, and
Martin L. Weitzman^{kk}

Introduction

In project analysis, the rate at which future benefits and costs are discounted often determines whether a project passes the benefit-cost test. This is especially true of projects that have long time horizons, such as those aimed at reducing greenhouse gas (GHG) emissions. In the case of

^{*}Stanford University; e-mail: arrow@stanford.edu.

^yUniversity of Maryland, College Park; e-mail: cropper@ff.org.

^zToulouse School of Economics; e-mail: christian.gollier@tse-fr.edu.

[§]London School of Economics; e-mail: b.groom@lse.ac.uk.

^{ffi}Columbia Business School; e-mail: gmh1@columbia.edu.

^kNicholas School of the Environment, Duke University; e-mail: richard.newell@duke.edu.

[#]Cowles Foundation, Yale University; e-mail: william.nordhaus@yale.edu.

^{**}Sloan School of Management, Massachusetts Institute of Technology; e-mail: rpindyck@mit.edu.

^{yy}Sanford School of Public Policy, Duke University; e-mail: billy.pizer@duke.edu.

^{zz}University of Arizona, Tucson; e-mail: pportney@email.arizona.edu.

^{§§}University of Gothenburg; e-mail: thomas.sterner@economics.gu.se.

^{ffifi}University of Sussex; e-mail: richard.tol@esri.ie.

^{kk}Harvard University; e-mail: weitzman@fas.harvard.edu.

At a workshop held at Resources for the Future in September 2011, twelve of the authors were asked by the US Environmental Protection Agency (EPA) to provide advice on the principles to be used in discounting the benefits and costs of projects that affect future generations. Maureen L. Cropper chaired the workshop. Much of the discussion in this article is based on the authors' recommendations and advice presented at the workshop.

Review of Environmental Economics and Policy, volume 8, issue 2, Summer 2014, pp. 145–163
doi:10.1093/reep/reu008

ffl The Author 2014. Published by Oxford University Press on behalf of the Association of Environmental and Resource Economists. All rights reserved. For Permissions, please email: journals.permissions@oup.com

Environment and Development Economics

<http://journals.cambridge.org/EDE>

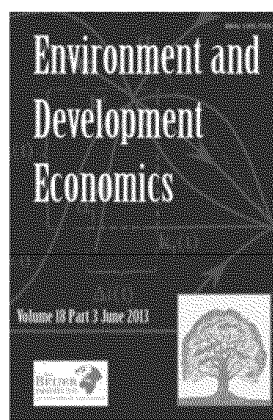
Additional services for *Environment and Development Economics*:

Email alerts: [Click here](#)

Subscriptions: [Click here](#)

Commercial reprints: [Click here](#)

Terms of use : [Click here](#)



Adaptation can help mitigation: an integrated approach to post-2012 climate policy

Francesco Bosello, Carlo Carraro and Enrica De Cian

Environment and Development Economics / Volume 18 / Issue 03 / June 2013, pp 270 - 290
DOI: 10.1017/S1355770X13000132, Published online: 29 April 2013

Link to this article: http://journals.cambridge.org/abstract_S1355770X13000132

How to cite this article:

Francesco Bosello, Carlo Carraro and Enrica De Cian (2013). Adaptation can help mitigation: an integrated approach to post-2012 climate policy. Environment and Development Economics, 18, pp 270-290 doi:10.1017/S1355770X13000132

Request Permissions : [Click here](#)



Downloaded from <http://journals.cambridge.org/EDE>, IP address: 159.149.215.123 on 30 Apr 2013

AD-DICE: an implementation of adaptation in the DICE model

Kelly C. de Bruin · Rob B. Dellink · Richard S. J. Tol

Received: 28 February 2007 / Accepted: 7 October 2008 / Published online: 30 January 2009
© The Author(s) 2009. This article is published with open access at Springerlink.com

Abstract Integrated Assessment Models (IAMS) have helped us over the past decade to understand the interactions between the environment and the economy in the context of climate change. Although it has also long been recognized that adaptation is a powerful and necessary tool to combat the adverse effects of climate change, most IAMS have not explicitly included the option of adaptation in combating climate change. This paper adds to the IAM and climate change literature by explicitly including adaptation in an IAM, thereby making the trade-offs between adaptation and mitigation visible. Specifically, a theoretical framework is created and used to implement adaptation as a decision variable into the DICE model. We use our new AD-DICE model to derive the adaptation cost functions implicit in the DICE model. In our set-up, adaptation and mitigation decisions are separable and AD-DICE can mimic DICE when adaptation is optimal. We find that our specification of the adaptation costs is robust with respect to the mitigation policy scenarios and parameter values. Our numerical results show that adaptation is a powerful

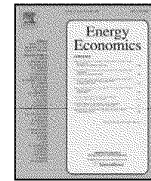
K. C. de Bruin (✉) · R. B. Dellink
Environmental Economics and Natural Resources Group, Wageningen University,
Hollandseweg 1, 6706KN, Wageningen, The Netherlands
e-mail: kelly.debruin@wur.nl

R. B. Dellink · R. S. J. Tol
Institute for Environmental Studies, VU University Amsterdam,
Amsterdam, The Netherlands

R. S. J. Tol
Economic and Social Research Institute, Dublin, Ireland

R. S. J. Tol
Department of Spatial Economics, VU University Amsterdam,
Amsterdam, The Netherlands

R. S. J. Tol
Department of Engineering and Public Policy, Carnegie Mellon University,
Pittsburgh, PA, USA



Editorial

Introduction to the Special Issue on Climate Adaptation: Improving the connection between empirical research and integrated assessment models



Integrated assessment models (IAMs), models that couple the human and natural systems, have been widely used by the climate change research community to project the emissions consequences of economic activity and the technical potential and cost of mitigation options; to perform cost-benefit analysis (CBA) to determine the optimal future path of GHG emissions and mitigation costs; and to assess the magnitude and incidence of climate impacts and associated economic cost of climate damages. DICE (Nordhaus, 1994), the first fully coupled IAM to account for the feedbacks of climate change on the economy, introduced the device of a climate damage function which was global in scope but with a highly simplified and aggregated treatment of either the meteorological drivers of impacts (global mean temperature change) or their physical manifestations across different endpoints, economic sectors and geographic regions. In the intervening two decades a succession of IAMs has followed this lead, incorporating climate feedbacks with limited complexity—or more commonly disregarding them altogether, even as computational advances have made possible increasingly detailed representations of the economic activity to which climate change poses risks. As a consequence there has been slow progress in modeling climate adaptation responses, and, to the best of our knowledge, no study has accounted for the implications of impacts and adaptation for the climate stabilization strategies.

Omitting climate change impacts and adaptation responses from IAM studies can affect their results in important ways. For one, climate feedbacks can reduce the pool of mitigation options which can understate the cost of mitigation policies; e.g., water shortages can limit the potential for hydropower and biofuel production could be limited by negative impacts on crop productivity. Omitting adaptation responses from the analysis can also bias the results in a number of ways; e.g., (a) adaptation responses could dampen the economic cost of climate impacts; (b) adaptation responses could change the baseline emission trajectory (e.g., greater air conditioning in response to higher temperatures could lead to higher emissions), making it more difficult to reach stabilization targets; and (c) adaptation investments could crowd out mitigation investment making it more costly to mitigate.

Given the importance of climate feedbacks and adaptation responses, a natural question is why have they been largely left out of IAMs? A reason that is commonly given is the inadequate empirical basis for characterizing the responses to be inserted into models. For the few studies that do attempt to incorporate these responses, engineering or natural science process simulations are often used to fill the gap; however, the latter models typically are computationally expensive, capture only a single link of the causal chain from meteorology to

physical endpoints to shocks to the economy, and, similar to IAMs, themselves need to be parameterized based on scarce empirical evidence.

The good news is that there has been a recent flurry of empirical research (econometric studies) in the economics literature that holds the promise of offering the necessary empirical foundation for simulating climate change impacts and adaptation. However, IAMs and process models have yet to take advantage of this potential. Why? First, econometric models capture more than one part of the causal chain, and because they are reduced form and not structural, the results are more difficult to incorporate into structural IAMs or process models. Second, econometric studies of impacts and adaptation are typically not done with IAMs in mind, and tend to focus at a level of detail (spatial and/or sectoral) that is far beneath IAMs' level of aggregation. The upshot is that heroic efforts on the part of the modeler are often necessary to translate econometric results into useable representations within simulation models.

To help address this disconnect, in May 2012 a two-day workshop was organized at the National Bureau of Economic Research (NBER) in Cambridge, MA by the Program on Integrated Assessment Model Development, Diagnostics, and Inter-model comparison (PIAMDDI), a research program funded by the U.S. Department of Energy, Office of Science.¹ The purpose of the workshop was to bring together key empirical researchers and integrated assessment modelers to (1) begin the discussion on devising ways to incorporate existing empirical work into models (translational work) and (2) develop ideas for joint research so that future empirical work may be better integrated into models (development work). The workshop consisted of sessions in six topic areas: water resources, energy, land use and migration, agriculture, extreme events and sea level rise, and health. Each session included reviews of the state of the art in empirical research and integrated assessment modeling of climate impacts and adaptation, given by an empirical researcher and a modeler, followed by a facilitated discussion. The papers in this special issue are an outgrowth of these presentations.

The first two papers focus on water. Sheila Olmstead's review focuses on the scope of the existing empirical literature on water supply, demand, and climate change adaptation, and its potential usefulness to incorporation into IA modeling. The paper begins by surveying estimates of the economic consequences of climate change impacts on water supply and demand in specific river basins, and the ability of

¹ The U.S. Department of Energy, Office of Science, Biological and Environmental Research Program, Integrated Assessment Program, Grant No. DE-SC0005171.

Modeling climate change feedbacks and adaptation responses: recent approaches and shortcomings

Karen Fisher-Vanden & Ian Sue Wing & Elisa Lanzi & David Popp

Received: 18 July 2012 / Accepted: 11 November 2012 / Published online: 5 December 2012
Springer Science+Business Media Dordrecht 2012

Abstract This paper offers a critical review of modeling practice in the field of integrated assessment of climate change and ways forward. Past efforts in integrated assessment have concentrated on developing baseline trajectories of emissions and mitigation scenario analyses. A key missing component in Integrated Assessment Models (IAMs) is the representation of climate impacts and adaptation responses. In this paper, we identify key biases that are introduced when climate impacts and adaptation responses are omitted from the analysis and review the state of modeling studies that attempt to capture these feedbacks. A common problem in these IAM studies is the lack of connection with empirical studies. We therefore also review the state of the empirical work on climate impacts and identify ways that this connection could be improved.

1 Introduction

The bulk of past efforts in integrated assessment have concentrated on developing baseline trajectories of emissions and mitigation scenario analyses. The DICE model (Nordhaus 1994) is considered one of the first attempts to account for climate feedbacks on the economy to determine the optimal level of mitigation in the context of cost-benefit. Climate

This article is part of a Special Issue on “Improving the Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis” edited by Alex L. Marten, Kate C. Shouse, and Robert E. Kopp.

K. Fisher-Vanden (✉)
Pennsylvania State University, University Park, PA, USA
e-mail: kaf26@psu.edu

I. Sue Wing
Boston University, Boston, MA, USA

E. Lanzi
OECD Environment Directorate, Paris, France

D. Popp
Syracuse University, Syracuse, NY, USA

Confronting the challenge of integrated assessment of climate adaptation: a conceptual framework

Ian Sue Wing & Karen Fisher-Vanden

Received: 13 October 2011 / Accepted: 21 November 2012 / Published online: 11 January 2013
Springer Science+Business Media Dordrecht 2013

Abstract Key limitations of integrated assessment models (IAMs) are their highly stylized and aggregated representation of climate damages and associated economic responses, as well as the omission of specific investments related to climate change adaptation. This paper proposes a framework for modeling climate impacts and adaptation that clarifies the relevant research issues and provides a template for making improvements. We identify five desirable characteristics of an ideal integrated assessment modeling platform, which we elaborate into a conceptual model that distinguishes three different classes of adaptation-related activities. Based on these elements we specify an impacts- and adaptation-centric IAM, whose optimality conditions are used to highlight the types of functional relationships necessary for realistic representations of adaptation-related decisions, the specific mechanisms by which these responses can be incorporated into IAMs, and the ways in which the inclusion of adaptation is likely to affect the simulations' results.

1 Introduction

Integrated assessments of climate change have concentrated on developing baseline scenarios of future greenhouse gas (GHG) emissions, and analyzing the economic consequences of emission mitigation policies. A pervasive limitation of existing integrated assessment models (IAMs) is their highly stylized and aggregated representation of climate impacts and the economic responses thereto, and the omission of specific investments related to climate change adaptation. This state of affairs originates in our incomplete understanding of the channels through which anthropogenic radiative forcing induces changes in meteorological variables—and through these, various other biophysical impact endpoints at regional scales—as well as what the concomitant damages to the various economic sectors within these regions might be. The good news is that this situation is slowly improving, with several advances made over the past decade to introduce impacts and adaptation into IAMs. However, systemic challenges to modeling adaptation continue to impede progress in this area.

This article is part of a Special Issue on “Improving the Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis” edited by Alex L. Marten, Kate C. Shouse, and Robert E. Kopp.

I. S. Wing
Boston University, Boston, MA, USA
email: isw@bu.edu

K. Fisher-Vanden (✉)
Pennsylvania State University, University Park, PA, USA
e-mail: kaf26@psu.edu

A 4-States DICE: Quantitatively Addressing Uncertainty Effects in Climate Change

Christian P. Traeger

Accepted: 13 March 2014 / Published online: 1 August 2014
© Springer Science+Business Media Dordrecht 2014

Abstract We introduce a version of the DICE-2007 model designed for uncertainty analysis. DICE is a wide-spread deterministic integrated assessment model of climate change. Climate change, long-term economic development, and their interactions are highly uncertain. The quantitative analysis of optimal mitigation policy under uncertainty requires a recursive dynamic programming implementation of integrated assessment models. Such implementations are subject to the curse of dimensionality. Every increase in the dimension of the state space is paid for by a combination of (exponentially) increasing processor time, lower quality of the value or policy function approximations, and reductions of the uncertainty domain. The paper promotes a state-reduced, recursive dynamic programming implementation of the DICE-2007 model. We achieve the reduction by simplifying the carbon cycle and the temperature delay equations. We compare our model's performance and that of the DICE model to the scientific AOGCM models emulated by MAGICC 6.0 and find that our simplified model performs equally well as the original DICE model. Our implementation solves the infinite planning horizon problem in an arbitrary time step. The paper is the first to carefully analyze the quality of the value function approximation using two different types of basis functions and systematically varying the dimension of the basis. We present the closed form, continuous time approximation to the exogenous (discretely and inductively defined) processes in DICE, and we present a numerically more efficient re-normalized Bellman equation that, in addition, can disentangle risk attitude from the propensity to smooth consumption over time.

Keywords Climate change · Uncertainty · Integrated assessment · DICE · Dynamic programming · Risk aversion · Intertemporal substitution · MAGICC · Basis · Recursive utility

JEL Classification Q54 · Q00 · D90 · C63

C. P. Traeger (✉)
Department of Agricultural and Resource Economics, University of California,
207 Giannini Hall #3310, Berkeley, CA 94720-3310, USA
e-mail: traeger@berkeley.edu

John Weyant*

Integrated assessment of climate change: state of the literature

Abstract: This paper reviews applications of benefit-cost analysis (BCA) in climate policy assessment at the US national and global scales. Two different but related major application types are addressed. First there are global-scale analyses that focus on calculating optimal global carbon emissions trajectories and carbon prices that maximize global welfare. The second application is the use of the same tools to compute the social cost of carbon (SCC) for use in US regulatory processes. The SCC is defined as the climate damages attributable to an increase of one metric ton of carbon dioxide emissions above a baseline emissions trajectory that assumes no new climate policies. The paper describes the three main quantitative models that have been used in the optimal carbon policy and SCC calculations and then summarizes the range of results that have been produced using them. The results span an extremely broad range (up to an order of magnitude) across modeling platforms as well as across the plausible ranges of input assumptions to a single model. This broad range of results sets the stage for a discussion of the five key challenges that face BCA practitioners participating in the national and global climate change policy analysis arenas: (1) including the possibility of catastrophic outcomes; (2) factoring in equity and income distribution considerations; (3) addressing intertemporal discounting and intergenerational equity; (4) projecting baseline demographics, technological change, and policies inside and outside the energy sector; and (5) characterizing the full set of uncertainties to be dealt with and designing a decision-making process that updates and adapts new scientific and economic information into that process in a timely and productive manner. The paper closes by describing how the BCA models have been useful in climate policy discussions to date despite the uncertainties that pervade the results that have been produced.

Keywords: benefit-cost analysis; climate change; integrated assessment; optimal carbon emissions; social cost of carbon.

DOI 10.1515/jbca-2014-9002

*Corresponding author: John Weyant, Department of Management Science and Engineering, Room 260, Huang Engineering Center, Stanford University, Stanford, CA 94305-4026, USA, Phone: +1 650 723 0645, Fax: +1 650 723 3506, e-mail: weyant@stanford.edu